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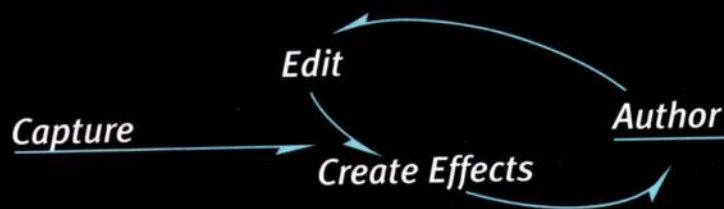
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For the complete interview with Danni Ashe see *The Facts of Life from the Web's Sexiest CEO* page 36. Thanks to Nicolas Sage and Danni.com for capturing the CEO side of Danni shown on this month's cover and inside opening photograph.



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Focus on the Real

WHAT IS REALLY REAL? IN THE WAKE OF THE CRASH OF THE NET ECONOMY, THAT is the only question. The Net economy, by its very soul and purpose, has been based on the speculative mining of promises: The promise to transform the functions of commerce, and the promise to alter how people use media and the role it plays in their lives. In the religion of the Net economy, the medium would become the core of life itself, and it would change the very nature of beings. We would all become more serious, more absorbed with ready access to knowledge, or we would be unable to compete, and we would wither on the sidelines of a Net world.

The failure of the first Net economy was its dependence upon precisely that degree of fervor. If it could not persuade people to that level of submission and transformation, it would not be able to deliver its promises. As our cover story this month points out, the greatest successes in the Net world have come through the world of adult content. As embarrassing as that realization may be for a young, proud, conquer-the-world economy, it is undeniably real.

But Net porn thrived for one basic reason—it provided access under the appearance of privacy. It did not create the desire for this content. It unleashed it, and through that freedom, we as a people discovered the prevalence of that desire.

And so it is with streaming media. By definition, it accommodates what we know people like—the moving image—with the technologies of knowledge, access, control, and speed. It brings all of the most powerful communications media to bear, for whatever the purpose. Streaming media can entertain or inform, and people don't have to be transformed for it to work. Streaming does not require that the belief system be the center of the universe. People already believe.

As we approach our third issue of *netmedia*, it has become clear to us that all that matters is what is really real. What developments in technology are facilitating the fulfillment of streaming media? What products and developments occur each month that make it impossible to ever see the media world the same? What is really real about enabling the inevitable?

We are returning to the idea lab, and we are going to streamline our own streaming media magazine. We are going to crystallize our circulation to include only those people who really, at this moment, are involved in making streaming media a reality. We will write our content for and distribute our magazine to those professionals who are transforming the way we communicate with streaming media *today*.

As a result, the tone of our magazine will be far more focused on what is real than on what might be. If you are involved with streaming media, you already accept its power and potential, and you already understand that there is no business model in the selling of promise. There is, however, a great one in the unleashing of established desire.

Additionally, we will be introducing *The Demo Room* on our website, www.netmedia-online.com. This exciting new section will select the most intriguing, effective, and enabling product developments, and through the magic of streaming media, demonstrate them on the Web.

We at *netmedia* intend to really matter by concentrating on what is real.



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BY TOM PATRICK MCAULIFFE

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NEWS | INFORMATION | OPINIONS ON THE STREAMING MEDIA INDUSTRY

NAB 2001—Digital Party in the Desert

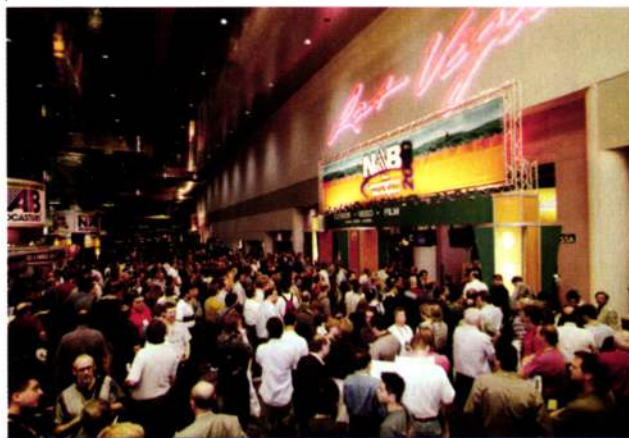
THE WORLD'S LARGEST trade event covering the convergence of broadcasting, multimedia and the Internet, audio and video communications, and telecommunications is set take place in Las Vegas, April 21 to 26. The National Association of Broadcasters (NAB) show is held annually in this desert gambling Mecca, and this year's event will feature more than 1,500 exhibitors and cover more than 1 million net

square feet in two separate convention halls. In addition to the exhibits, NAB2001 will feature more than 150 sessions as well as the return of the Digital Video Production Workshop, which will deliver technical solutions, business insights, and practical how-to information in two tracks: Production Tools & Techniques and Web Delivery.

Although HDTV and DTV demos have dominated NAB

for the last several years, the emphasis on those technologies is expected to be less significant this year as a result of the slow adoption of digital television by consumers. Meanwhile, streaming media and digital video production tools are expected to gain in visibility as more and more manufacturers of traditional broadcast equipment focus more tightly on the burgeoning Web-based video market. In recognition

of that trend, the show will debut a new pavilion, called e-TOPIA, that will house more than 250 exhibitors demonstrating the newest technologies in electronic media. In addition to the regular exhibit hall hours, e-TOPIA will be open on Sunday, April 22 from 2:00 p.m. to 6:00 p.m., and complete NAB convention, conference, and exhibit details are available at www.nab.org/conventions/.



Already the largest trade event covering the convergence of broadcasting, multimedia and the Internet, audio and video communications, and telecommunications, NAB 2001 coverage will be even more extensive than NAB 2000 (shown above) with the addition of e-TOPIA, a hall showcasing more than 250 exhibits in electronic media technology.

The Click and Brick Worlds Get Hitched

IN ONE OF THE LARGEST INDUSTRY MERGERS ON

record, online access giant America Online and content titan Time Warner received unanimous FCC approval to combine forces. Like a couple of honeymooners, the new AOL Time Warner company promised to harness its huge resources to expand consumer choice for Internet access, entertainment, and communications. A new advertising campaign should be underway by the time you read this.

To ensure that the \$108 billion merger succeeds, the government has set strict limits to keep the companies from crushing the competition and to maintain an open, competitive environment. New AOL Time Warner CEO Gerald Levin says the combined firm's growth should be 12% to 15% overall this year with a 30% increase in cash flow.

AOL provides Web access and content to more than 25 million users, with the average AOL user online approximately 65 minutes

per day. It was AOL's instant messaging as well as open access that was of most concern to the FCC and Federal Trade Commission, which also had jurisdiction over the deal. Concerns about content independence, Internet access, and price fixing had industry watchers crying like Richard Simmons at Streisand's wedding. According to officials, however, all of the concerned parties had their grievances aired, if not addressed, before the pen hit the paper.

Time Warner is a content whale and owns the cable networks CNN, HBO, and the Cartoon Network as well as such magazine titles as *Time*, *People* and *Sports Illustrated*. It also offers movies and other programming under its Warner Bros. labels. Its extensive network of cable lines is second only to AT&T. Many observers within the industry and in the general media believe the new company has the best chance of any company to merge the worlds of television, the Internet and traditional media. ➤

NBCi Strives to Make Everyone a Streamer



IN AN MBAi EXAMPLE OF THE SYNERGISTIC DEAL,

NBCi, the interactive Web domain from the network of the same name, has teamed up with iClips, a consumer-oriented video streaming company, with the intention of putting streaming video onto the desktops and laptops of 24 million online viewers. As a result of the partnership, NBCi members will be able to create and post personalized videos to their own classified pages and personal websites.

iClips CEO Michael Diamant says that the deal is a large step toward the company's goal of making video as easy to use as the text-only approach common to online communications. The company, founded in 1999, is a private venture and has headquarters on Broadway, just blocks from the NBC television studios in New York. On its website, iClips has developed a "My Video" area, which gives NBCi members access to the tools necessary for creating, storing, sending and sharing their own streaming video messages throughout the world. All the services are free to the member viewer.

"NBCi is committed to delivering broadband solutions to our members to enhance their online experiences, and our alliance with iClips reinforces our commitment to offer leading innovative technologies to our members," says Josh Mailman a VP at NBCi. "We look forward to working with iClips to provide our members with the most dynamic communication tools available online."

Those close to the negotiations indicate that in addition to upfront fees, NBCi has also guaranteed iClips a percentage of advertising revenues resulting from the partnership. The agreement also calls for registered users to get up to 20MB of free storage space, which stores about an hour's worth of video, and there will be a real-time video messaging feature as well.

New Organization Forms to Promote MPEG4 Standardization

A GROUP OF LEADING

technology titans recently launched the new Internet Streaming Media Alliance (ISMA) in an effort to accelerate the market adoption of standards for streaming rich media over Internet Protocol (IP). The ISMA (www.ISMA-Alliance.org) is a non-profit corporation founded by Apple, Cisco, Kasenna, Philips, and Sun Microsystems, and the alliance's current supporters include Macrovision, Optibase, SGI, and Virage, to name but a few. The founding companies believe that their collaborative efforts will accelerate the broad market adoption of open standards and interoperability while encouraging the development of competitive solutions. ISMA founders began developing an initial specification for MPEG4 over IP at its first formal meeting in February 2001. Upon completion of specifications, the ISMA will actively educate and promote the specifications to developers and those seeking to deploy rich media streaming solutions.

Although perhaps a noble idea, some industry observers have expressed concern about those high-profile names not on the organization's membership list – most notably, such streaming giants as Akamai, iBEAM, RealNetworks, and Microsoft. The new alliance

has indicated that it is open to any and all interested parties, but it makes no secret of its love for MPEG4, which these missing companies do not share. Consequently, the question is, can a streaming media association be effective without them?

According to RealNetworks, it has not made a firm decision about whether or not it will join the new group; however, it would appear to be unlikely. "As you're probably aware, RealNetworks is already deeply committed to standards that promote interoperability. We actively participate and promote standards that benefit digital media delivery through standards bodies such as the W3C and the IETF," says Ben Rotholtz, general manager for products and systems at RealNetworks. "The heavy lifting of developing, refining, and establishing standards will continue to happen in those organizations. ISMA is not a substitute for functioning standards bodies and may be largely redundant. We're shipping standards-based software today. Indeed, we announced an entirely new digital media architecture, RealSystem iQ, the day before ISMA was announced." That technology, he says, enables the delivery of all media to a RealPlayer as well as QuickTime content to





It's a Win for Omneon in Third Round

OMNEON VIDEO NETWORKS, the new-media infrastructure company, has announced the completion of a \$24.8 million third round of financing by prominent venture capital firms. The round was led by Meritech Capital Partners, and new investors include Chase H&Q, Intel Communications Fund, Palo Alto Investors, and Lucent Venture Partners. The company has now raised more than \$57 million in venture capital and corporate funding.

"We are pleased to receive this financing, which will support our business objective to become the new-media infrastructure for content providers and distributors with business models that include streaming media to digital television, HDTV and beyond," says Lawrence Kaplan, president and CEO of Omneon. "This funding will help advance the Video Area Network, which can openly support multiple formats, applications, and transmission standards for television and Internet applications."

Omneon's Video Area Network (VAN) is an integrated networking and storage platform based upon IEEE 1394 networking architecture and Fiber Channel storage. The VAN enables facilities to ingest, route, store, share, distribute, and stream digital media comprised of audio, video or any type of related data. Omneon Video Networks, Sunnyvale, CA, is privately held and funded. ☐

Akamai Surfs the Big Waves

CONTENT DELIVERY SERVICE PROVIDER (CDSP) AKAMAI

Technologies recently announced milestones for growth as one of the world's largest Internet networks. At press time, the company was poised to announce its new (and improved?) financial results for Q4 2000 and projections for 2001.

The company's new recurring customer count and network deployment results closing out the year 2000 shows Akamai had more than 1,325 recurring customers under contract (total is about 2,800 clients), compared to 1,115 at the end of the third quarter 2000. Additionally, deployment of Akamai's global network expanded to include more than 460 networks, up from 335 last year. The number of Akamai servers was more than 8,000, compared to 6,060 in 2000, according to public documents from the company. Its servers are in 54 countries and are directly connected within more than 460 different telecommunications networks.

Akamai also recently announced a number of strategic alliances including one with MSHOW.com, which is involved in e-communications services, and SiteSmith, a provider of comprehensive Internet infrastructure management services. Earlier this year at the Morgan Stanley Dean Witter Internet, Software & Networking Conference, Chairman & CEO George H. Conrades said, "Akamai has achieved great success by first servicing the Web's top portals and e-businesses."

The last year has not been easy for the big kahuna of the streaming Web, however, and diversifying has been key. "Over the past 12 months, we have expanded our reach to include corporations from important vertical sectors, including finance, healthcare, automotive, and publishing," Conrades said. ☐



Such technology as the S600 allowed Akamai to serve about 2,800 clients last year.

Avid and Vsoft Meet Demand

AVID INTERNET SOLUTIONS

(AIS), the Internet infrastructure division of Avid Technology, and Vsoft, creator of application software for video services, have authored a seemingly win-win agreement to market a bundled solution for video-on-demand that can deliver up to 1,500 MPEG2, DVD-quality, streams. The

solution can also distribute 3,000 MPEG1 VHS-quality streams of video. The OEM agreement enables Vsoft to offer VideoClick video services software with AIS' Trilligent Cluster turnkey streaming media system (see March issue, page 14). For more information, visit www.vsoft.com and www.avid.com. ☐

RealNetworks clients using RTSP and RTP – exactly as prescribed by the new ISMA.

As for the argument that the industry needs to standardize MPEG4, RealNetworks says that it is not so sure. Pointing to RealNetworks' 85% market share of streaming media content, Rotholtz says, "That leadership is a direct result of delivering the very best quality audio and video at bandwidth savings that is compelling to content creators and to the consumer. We strongly believe that RealVideo 8 and RealAudio 8 deliver the best quality and bandwidth savings of any video and audio codec technology available. However, the significant investments that we've made in standards, open APIs, and an OS-independent architecture has enabled MPEG1, MPEG2, and most recently MP3 solutions all within RealSystem iQ. We support over 45 media types today. We now have partners that are actively working to support MPEG4 video within RealSystem iQ. While we don't believe that MPEG4 will achieve critical mass because of inherent bandwidth and quality limitations, we are committed to providing the freedom and flexibility for content creators to use this older codec technology if they so choose."

Others see the digital format as the answer to a host of industry woes. "A standard such as MPEG4 would solve many issues facing the industry today, such as the ability for consumers to play any format with a single player," says Sujata Ramnarayan, a senior analyst with GartnerGroup, an industry market research firm. "In general, it would make it easier to offer many video-related services. It would also benefit content providers who would not have to encode at different bit rates and formats." ☐



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Telestream and Virage Become Dance Partners

TELESTREAM OF NEVADA CITY, CA, CREATORS OF

FlipFactory encoding software and the video-enabled file sharing and format conversion website of the same name, has announced a strategic partnership with Virage, a company whose software extracts closed caption text and organizes video content for instant, easy search and retrieval.

"Supporting Virage-enabled video allows asset owners to intelligently categorize and manage archives via the Internet," says David Heppe, Telestream vice president of marketing and business development. "Together, Virage and Telestream solutions automate the processes of indexing, cataloging, and publishing media in multiple formats, saving organizations valuable time, money, and resources."

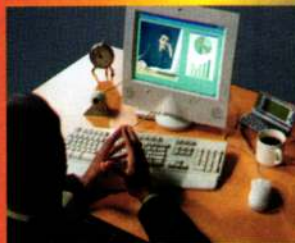
Unlike the streaming music world, which has widely adopted MP3 as a standard, the streaming video world is not converging on a single standard. To accommodate viewing preferences, a single video source file is commonly published in three different popular streaming video formats (RealNetworks, Microsoft's Media Player, and QuickTime) at multiple bit rates each to accommodate different connection speeds (i.e., 56Kbps, DSL, cable). That means that for every source file, three or more streaming video files need to be produced and logged for easy



Telestream, perhaps best known for its FlipFactory encoding and content-management tools (shown above), has allied itself with Virage, whose software extracts closed caption text and organizes video content for instant, easy search and retrieval.

search and retrieval. For content owners posting large amounts of content to their websites on a daily basis, this can present a real challenge. Users are looking for fast, easy solutions to the daunting tasks of publishing and managing their Web audio and video content. These two companies, among others, hope to simplify the task of encoding, logging, and ultimately accessing large amounts of streaming content. ☺

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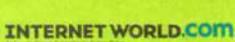


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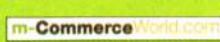
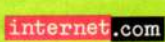
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New Site Empowers Broadcasters

INEWS, A PROVIDER OF convergence newscasting solutions for television networks, local television stations, and webcast networks, and Media Exchange International, a Washington D.C.-based company that delivers multimedia streaming content on the Web, recently announced the first fruits of their alliance that began last fall. The partners have created a new portal that enables the fast and simple exchange of news-oriented digital media materials from a broad array of content providers. Serving as a media asset

pool for various vertical markets and information-driven companies and organizations, the site reflects the broadcast industry's move into the webcasting market space. The two firms will collaborate to facilitate the online sale and distribution of video and media content.

Under the terms of the agreement, the website will offer broadcasters the opportunity to market and sell their proprietary video content, making it available for preview and purchase on. The new joint website, www.iNewsXchange.com,

also offers participating broadcasters the opportunity to stream their video features and those of other affiliated organizations to their websites. Broadcasters receive a custom ConnectCast unit that links to the iNewsXchange and enables broadcasters to build custom video playlists, tapping new revenue streams for exciting content without the hassle and expense of development, bandwidth, and storage. ♪



SHEDDING LIGHT ON CRIMES OF COMMUNICATION THROUGH TERMS AND ACRONYMS.

- **M-Commerce:** Electronic marketing and sales via wireless technology. Most cannot get it right on an RGB or NTSC, monitor, so how well are they going to do on a 3-inch cell phone screen?
- **Sticky content:** Online information that draws site visitors and keeps them on a particular page or website.
- **Pheaker:** As in a "phone pheaker" or someone who does not know that you can use the Internet to make near-free phone calls now.
- **Interstitial:** Literally "in between," as in "That online ad is an interstitial." Any advertisement that happens before, during, or after an online streaming content presentation. Traditional TV commercials could be called interstitial.
- **WAP:** Wireless Application Protocol, one of several protocols vying for king of the hill in the huge mobile streaming marketplace of the near future. This standard handles Web browsing, email, chat, and more as you are on the way to your next fender bender. ♪

Loudeye Remains Optimistic Despite Cuts

ON THE HEELS OF

announcing that fourth quarter 2000 earnings were less than expected, streaming encoding leader Loudeye Technologies announced that it would cut 50 positions, which is about 18% of its work force. At press time, Q4 revenues were anticipated to be \$3.9 million, falling short of analysts' expectations. After the reduction, the company will have about 225 to 250 employees with a resultant cost savings totaling approximately \$3 million each year. The reductions seem to have been expected as part of the general malaise of the Internet market (and streaming media forms in particular) on both the revenue and investment fronts. Officials at the company, however, remain upbeat.

"Market conditions and hesitation from the investment community had a financial impact on many new-media

companies building a business around digital content. As an enabler of digital media companies we are not immune to these conditions, but we remain incredibly optimistic about the digital media space, and online music in particular," says Peter Kellogg-Smith, vice president of marketing.

The company and others like it have seen a series of disappointing quarterly earnings and profit over the past year and a half. In press releases, President CEO Dave Bullis indicated that this was done to prepare the company for the long haul and that Loudeye will continue focusing its current offerings including fully supporting its Vidipax media restoration subsidiary in New York, its Media Syndication application and the Loudeye Media Subscription Services. Officials said a key for the future will be an increased emphasis on digital audio and music online.

Some analysts believe that online music has been the only business model that has proven to be viable at this point in time, but the coming onslaught of broadband availability will lead to video-based streaming giving audio a run for the money.

"In 1997, nobody believed audio and video on the Internet would become popular. Three years later, every major film and music studio is quickly ramping up an Internet streaming strategy," says Kellogg-Smith. "The widespread decline in financial markets, which has affected almost every industry segment, does not change the inevitable fact that an IP infrastructure will forever change the way we consume entertainment, and we will be there." ♪



Interactive TV? The People Say, Yes.

THE CABLE & TELECOMMUNICATIONS ASSOCIATION FOR Marketing (CTAM) recently released the results of a new study on interactive television. The study, *Interactive TV: Are Consumers Ready?*, shows 79% of digital cable and 55% of analog cable customers are very or somewhat receptive to interactive features delivered via TV. The findings, in general, show that digital cable customers, who have experienced the Interactive Program Guide, crave additional interactive options. In homes with PCs, 86% of users co-locate the computer in the room with their TV. In addition, those with co-located PCs report simultaneous usage. According to some experts, this consumer interest may be the impetus needed to convince major cable content providers to take a stronger look at providing more online programming via streaming.

The CTAM is dedicated to the discipline and development of consumer marketing excellence in cable television, new media and telecommunications services. See www.ctam.com for more info. ➤

CTAM is dedicated to the discipline and development of consumer marketing excellence in cable TV, new media and telecommunications services.

The website www.streamsearch.com is great for finding relevant streaming content.

SITE SCOPE

www.whalemail.com
MEDIA FILES CAN TEND TO be quite large these days, especially when they are video and audio files. The file size limitation of 5MB or smaller that many email/ISP services impose can ruin your day. Sort of like a free although temporary FTP site, this website allows users to store large files for up to a week with no cost. Simply go to the site, register, and store your video or audio file via an email attachment up to 50MB in size. Just email whomever you would like to receive the file, and they will have up to one week to retrieve it.

www.streamsearch.com
LOOKING FOR STREAMING audio and video on the vast info superhighway can be exhausting. Here is a URL you should bookmark and visit regularly. With the tagline of "Remote Control for the Web," it's a great resource for finding relevant streaming content. Movies, TV, and radio sample files are available as well as free streaming contents. Check this site out, and your search may be over. ➤

Do you know of a site with great streaming media or online tools that will help produce outstanding results? Email the URL to reelcom1@home.com.

ICTV Adopts On2 Video Codec

ON2.COM, A LEADING broadband technology company and creators of the VP3 Codec Plug-in has signed a deal with ICTV, supplier of what it claims is the only fully functional TV browser available for digital cable. As part of the deal, ICTV's television browser will support On2's proprietary TrueMotion VP3 video codec. Exact terms of the deal were not disclosed. Since 1992,

On2.com has been specializing in providing full-motion, full-screen, TV-quality video compression and streaming technology. Its video compression technology, VP3, reportedly offers the highest quality streaming video at the lowest possible data rates regardless of platform.

ICTV supplies communications infrastructure to network operators with a digital

ITV delivery platform that provides headend-based cable TV operators with a solution that enables delivery of streamed broadband content via Internet, email, and Interactive TV applications to any digital set-top box.

ICTV's TV Browser supports diverse sources of broadband streaming media, according to the company. Its TV Browser is capable of support-

ing a large selection of rich media plug-ins, such as RealNetworks' RealPlayer, Apple's QuickTime, Macromedia's Flash and Shockwave along with Microsoft's Windows Media Player. Strategic partners for ICTV include TV Guide Interactive and Cox Cable. The Company has 19 issued patents with 10 patents pending and can be found at www.ictv.com. ➤



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CURRENTS

Invoking A Future

EVOKE COMMUNICATIONS RECENTLY ANNOUNCED

corporate restructuring, staff layoffs, and the transfer of some services despite 2000 Q4 earnings that are expected to be higher than forecast. The company, a leader in the online meeting services market, has presented new strategies that read almost like an extract from an MBA dissertation and include comments about the need to concentrate on core business, reduce operating expenses, and accelerate profitability, which is anticipated in Q1 of 2002.

"We have achieved tremendous growth in our core services – webconferencing and collaboration – as evidenced by the continued strength of our financial performance in the fourth quarter," says Paul Berberian, Evoke Communications' president and CEO. "We continue to drive usage of our services by adding customers, further penetrating existing customers and adding new distribution partners. By focusing our efforts on these core competencies, we can most efficiently and effectively grow our business."

In addition to operation cut backs, Evoke will outsource its webcasting and streaming services to well-known Digital Island. "Evoke Communications is clearly the leader in virtual meeting services and we expect them to continue to strengthen that position," says Ruann Ernst, chairman and CEO of Digital Island. "As reseller partners, our offerings complement one another perfectly." Perhaps a June wedding is in the offing? ☺



The CPU Flu

WITH DEMAND FOR PERSONAL COMPUTERS AND RELATED

products weak, profits are shrinking at Hewlett-Packard, while Gateway says that it will slash thousands of jobs. Officials at HP and others were amazed at how low December PC-related orders were. Gateway, says that it will cut more than 10% of its 21,000-member workforce to increase profitability. Gateway's 2000 Q4 earnings missed Wall Street expectations by 25 cents per share.

At press time, HP issued an earnings warning. Prior to that, it had said that it expected revenue to grow by 15% to 17% in fiscal 2001. Analysts and industry watchers indicate that the computer market downturn is due to a somewhat saturated customer base and a lack of new groundbreaking must-have technologies. The fever is expected during Q3 and Q4 of this year with an upturn in PC sales. ☺

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For the Streaming Media Industry

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STREAMSTATS

NUMBERS AND STATISTICS FROM MARKET RESEARCHERS AND INDIVIDUAL COMPANIES:

- Every week, more than 350,000 hours of live sports, news, music, business communications and entertainment are streamed over the internet using RealSystem technology. The are also currently "hundreds of thousands" of hours of content available to users online and on demand. RealSystem software is used to deliver content on more than 85% of all websites with streaming media. *Source: RealNetworks*
- By 2004, more than 41 million households worldwide will subscribe to broadband services at speeds up to 384Kbps, and 75 million people will listen to streaming Internet audio and radio. *Source: Live365.com*
- Distance Learning (called e-Learning by some) via point-to-point teleconferencing and online streaming technology will reach almost \$12 billion by 2004. *Source: W.R. Hambrecht & Co.*
- iBEAM and CinemaNow have announced the launching what is believed to be the world's first full-time streaming pay-per-view movie service on the Internet. *Source: www.thestandard.com*
- American Express recently released its first Global Internet Survey. It researched more than 10,000 random Internet users and non-users in 10 countries. Sweden, the USA and Australia were the top three countries in terms of overall usage with email, information gathering, and entertainment the top reasons for going online. Tickets, books, and videos were the top three items purchased via the Web. *Source: AMEX GIS 2000*
- More than 60% of the leading consumer-oriented web sites are already streaming either some form of content or advertising with 89% of websites using streaming by 2003. *Source: Jupiter Communications*
- Akamai Technologies provides streaming services to nine of the top 10 radio webcasts and 14 of the top 20 online channels, and it also streams 39 of the top 75 websites that feature webcasting. *Source: Akamai*

Download Your Favorite Music Video

MUSIC GIANT BMG

Entertainment plans to offer music videos for distribution on the Web, using the products and services of Akamai Technologies and Virage. BMG states that more than 1,000 of its music videos will be accessible through an online streaming network of syndication partners. Eventually,

the company will release a substantial portion of its video library, including rare catalog footage. Akamai's FreeFlow Streaming service and its huge network of servers will deliver BMG's award-winning content. Virage will provide its SmartEncode services, Syndication Manager software, and application hosting abilities.

Bitmovers Reorganizes and Changes its Name

BITMOVERS SYSTEMS

announced it is reforming its Internet presence division, formerly known as Bitmovers Networks, into a new company called BOPJET Media. The move is part of the company's strategic restructuring, allowing each of its divisions to focus on their core strengths and continue to try to build shareholder value. "We have three divisions: networks, solutions, and software. We want each division to optimize efficiency and focus," says Bitmovers' CEO Sean K. O'Mahony. "While the divisions will still draw on each other to maintain the parent company's strength in the industry, we believe a certain amount of separation will ultimately help each division capture a larger market position

and promote even better customer service."

Building on Bitmovers Networks' long history of providing high-availability, quality stream hosting and solutions, the company is reportedly working to enhance those services and increase its visibility in the marketplace. The company has also released Streaming Media Calculator 1.5, a simple, free utility to aid users in calculating various parameters regarding streaming QuickTime media files. Users can use the product to measure the effect variables, such as stream rate, length of stream and file size, have on bandwidth usage and final costs. The Streaming Media Calculator is currently only available for the Mac at www.bitmovers.com or www.cnet.com.



Field Testing Interactive Television

TANDBERG TELEVISION AND TELENOR RECENTLY

announced they would partner on the first significant consumer trials of MPEG over IP technology to deliver streamed broadcast-quality TV, video-on-demand, and Personal Video Recorder services over IP networks. The trials, which began December 2000, concluded March 2001. The process was part of Telenor field tests of its broadband full-service network (FSN). The new network will offer a new method to receive streaming video and audio entertainment and information. The trials will provide consumers with a wide choice of multimedia services, including video-on-demand, digital TV, live and scheduled broadcasts, and PVR services via a PC linked to an STB. The trials will also see the deployment of the new TANDBERG Television IP MultiStreamer, which enables the distribution of MPEG2 broadcast streams over IP networks. Customers include the Australian Broadcasting Corporation, the BBC, and various U.S. FOX affiliates.

Primal Stream.



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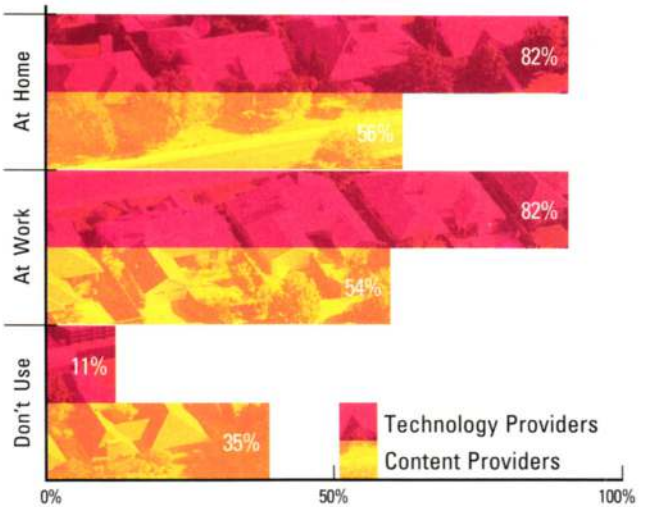
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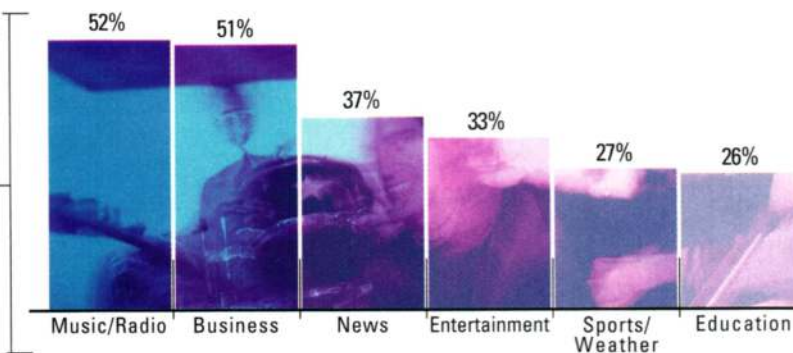
DO YOU USE STREAMING MEDIA AT HOME OR AT WORK?

Professionals who access streaming media from work also tend to access it from home as well.

PROFESSIONALS WORKING IN SUCH STREAMING media-friendly fields as media, production, and technology, tend to access streaming media from work and home equally. Those working as technology providers,* however, access streaming considerably more than those working as content providers**. Nearly 82% of technology providers access streaming media from both work and home, but only about 54% of those surveyed who work for content providers are making use of streaming. A surprising 35% of content providers and 11% of technology providers report that they do not use streaming media. (Base of 169 respondents)



FOR WHICH OF THE FOLLOWING REASONS DO YOU USE STREAMING MEDIA WHEN ACCESSING IT FROM HOME?



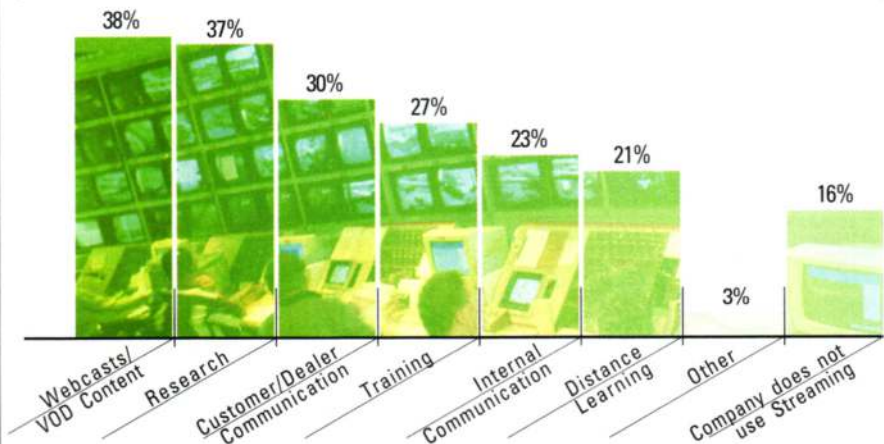
Music/radio and business are the primary reasons respondents stream media at home.

SURVEY RESPONDENTS WHO USE streaming media at home most often do so to access music/radio (52%) or for business purposes (51%). Streamed news and entertainment are each accessed at home by one-third of respondents. Sports, weather, and personal schooling/education are other types of streaming media activity used by respondents. (Base of 101 respondents)

Companies use streaming media primarily to produce webcasts or VOD content and research outside websites.

COMPANIES USE STREAMING FOR a variety of purposes, but according to survey respondents, the top two reasons are to produce webcasts or VOD content (38%) and to research outside websites for industry-related news information (37%). One out of three respondents say their companies use streaming media to communicate with customers or dealers, while 23% list internal corporate communications as an application. Another 27% of companies report training and 21% list distance learning as reasons for using streaming media. (Base of 117 respondents)

FOR WHICH OF THE FOLLOWING PURPOSES DOES YOUR COMPANY USE STREAMING MEDIA?





WHERE DOES YOUR COMPANY MAKE USE OF STREAMING?

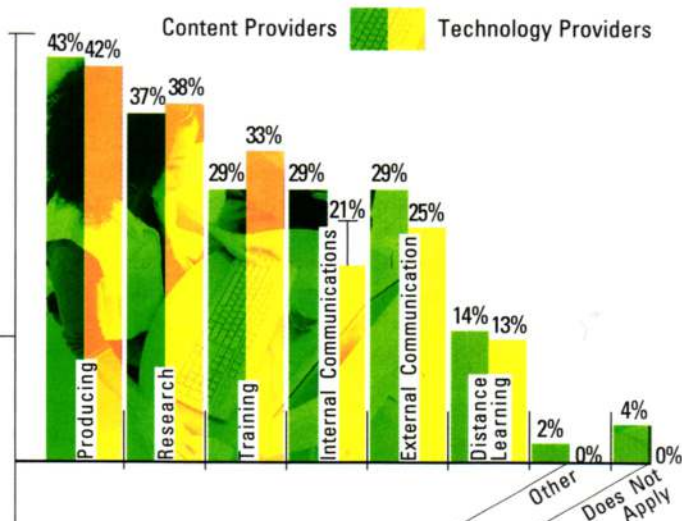
Most companies who stream media do so on their external website.

WHILE 63% OF COMPANIES WHO STREAM MEDIA SAY THEY are using streaming on their external website, streaming is also used significantly on proprietary networks (34%) and on internal Intranet sites (32%). (Base of 98 respondents)

People don't just work while at work.

ALTHOUGH 77% OF THOSE WHO ACCESS streaming media at work do so for job-related purposes, there are times many folks say they are using streaming for other purposes during work hours. Nearly two-fifths (39%) access streamed news information. Some 32% access streamed music/radio. And 24% of respondents list schooling or education as reasons for accessing streaming at work. Other streaming activities include sports, weather, and entertainment. (Base of 98 respondents)

FOR WHICH OF THE FOLLOWING PURPOSES DO YOU ACCESS STREAMING MEDIA WHILE AT WORK?



FOR WHICH OF THE FOLLOWING BUSINESS PURPOSES DO YOU PERSONALLY USE STREAMING MEDIA WHILE AT WORK?

Producing webcasts or VOD content is the primary business reason respondents use streaming media at work.

MANY OF THE SURVEY RESPONDENTS WHO REPORT using streaming at work do so because they are actually producing content. Streaming is also used in varying degrees for researching other websites, training, and internal and external corporate communication. (Base of 98 respondents)

Methodology: Intertec Publishing's planning & research department conducted the study presented in this article. On November 10, 2000, 1,000 surveys were mailed to *netmedia* subscribers. These are professionals working in the areas of media, production, education, business, and technology who could reasonably be assumed to have a strong interest in streaming media technology. Results, unless otherwise stated, are based on 169 respondents. The effective response rate is 17.2%.

***Technology Providers** include ISP or Network Providers, Application Service Providers, Web Hosting Services, & Other Streaming Media Technology Developers.

****Content Providers** include Streaming Webcaster or Content Providers, Television Broadcasters, Motion Picture Studios, & Independent Production/Post Production/Special Effects Facilities.

Content Is King

MY WIFE LIKES TO LISTEN TO music while at work. She used to copy AudioCDs into her RealJukebox application, but that took a lot of space on her hard drive and was problematic when she had to switch systems. Lately, she uses a combination of streaming audio resources, including Radio.sonic.net.com, and plays local radio stations over the

had problems logging on to the station and wonders if that is the reason. Will the putting out of the dotcom fire make it increasingly difficult to find streaming media?

Of course, there's no mistaking that the Web economy of the late '90s has given way to skepticism, if not pessimism, about Internet-related businesses. The example of our one local radio station's service trouble is just a hint at the larger troubles facing companies that just a short time ago seemed to have the potential to make a lot of money. Internet stocks have hit the skids, and companies are laying off employees, restructuring, and looking for investors or buyers.

What does this mean for the future of Internet streaming media? Has the wave passed before it ever got a chance to peak?

It's really not a hard question, and not that surprising an answer. Dotcom companies may have given Wall

Street an exciting sideshow for the last few years, but for streaming media, the Internet is only the medium and not the real story.

The Medium Is Not the Message

The difference between media on the Web and regular webpages is that the focus of

media is on enabling content for entertainment and communication. Sure, the dotcom meltdown makes it harder for smaller Internet companies with good ideas to get funding from the old sources, thus forcing those companies to bring interesting solutions to market.

In the case of streaming content, the Internet is a vehicle for offering viewers more direct, more current, and more personal access to what they want to see and hear. The availability of compelling content will drive streaming media. The appeal of the greater Internet has been lost, but the funding and desire in the entertainment industry remains the same. There is also plenty of money to be made by connecting content with viewers, and that is what will drive this wave.

Ultimately, we don't know whether the timely news coverage from organizations like CNN.com, ABCNEWS.com, or MSNBC.com that will reach critical mass and drive Internet media, or maybe consumers buying new-release videos over the Web or gaining access to independent movies not available anywhere else will be the killer application. Will watching digital television over the same high-speed Internet connection that people use to browse the Web change the American living room? Perhaps wireless videophones will bring people closer together, and nanny-cams will allow parents to watch their children from afar.

I have my ideas and predic-

tions, but the marketplace will have to decide what it wants and what it can afford. Where there is money to be made, forward-thinking companies will find a way to earn it. With the exception of the AOL and Time Warner merger, the entertainment industry is far bigger than the computer business, and streaming media is going to grab as much of the market as it can. If nothing else, the merger foreshadows how technology can bring both industries together.

Content as a Process

Streaming media technology is crucial to opening new doors, especially in these relatively early days. There are plenty of details to be decided before any streaming media applications break from a strict audience of technically savvy users. Making streaming video a mainstay of popular culture will take some time, some work, and some insight.

Still, my wife's radio station difficulties aside, streaming audio is already firmly entrenched, offering music, news, and sports. Much different from the general Internet gloom and doom that the NASDAQ watchers see, Internet media is only at its beginning. There are plenty of problems to solve—bandwidth, copyright, revenue, viewership, and ease of use, to name a few—but content is king. Content will drive Internet media. □

Jeff Sauer, contributing editor for *netmedia*, *Video Systems*, *Presentations*, and *NewMedia*, is the Director of the DTV Group Lab in Cambridge, MA, an industry research and product-testing organization.



Kevin Rechin

Web. Of course, that is nothing special. Thousands of people use streaming media every day.

Unfortunately, my wife recently found out that her favorite radio station's streaming service provider is going out of business. She has already

The present thinking in the streaming media industry is just too present.

Some say there's a digital media revolution going on. To GMV Network, it's more of an evolution. Where survival means you had to start solving tomorrow's problems yesterday. With standards-based technology. Ideas that improve streaming media quality while reducing cost and bandwidth demands. Visionary products like the GMV Network EdgeServer™, the one answer for a multi-platform planet. And that...is only the beginning.



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BET Radio is the best source for urban music – R&B, jazz, gospel, techno, and hip-hop – on the Internet.

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www.BET.com

BLACK ENTERTAINMENT

Television (BET) has had its finger on the pulse of the African-American community for more than 20 years. The cable network was one of the first African-American-owned companies to leap into the future with the launch of BET.com last year. The site offers a wealth of information focusing on news, entertainment, business, and sports issues and how they directly affect the African-American community. The best aspect of this site, jam-packed with info, is its radio station. *BET Radio* is the best source for urban music – R&B, jazz, gospel, techno, and hip-hop – on the Internet. In my opinion, there isn't a better rotation of songs being streamed anywhere, and there are no commercial interruptions. The jazz channel is particularly strong, featuring an exceptional sampling of pioneering

artists, including Charlie Parker, John Coltrane, and Sarah Vaughn. The station doesn't mess around with cheesy, New Age garbage and painfully bland contemporary jazz: it offers a real representation of the only original musical art form created in America. The only drawbacks with *BET Radio* are that you cannot forward past songs you don't want to hear or create a personalized rotation of songs. The music directors do such an excellent job of programming, however, that there really isn't much of a need for those functions, offered on other Internet radio stations. A bonus is that you can go inside the music and find out what's going on in the music industry with *The Word* and *Backstage. Ya' Heard* allows you to travel into the future by listening to material by unsigned artists, and *The Streamline* gives you a chance to see videos of today's hottest urban artists. —Shawn Edwards



The *Whirl o'Purr* section of mumbleboy.com features All Girl Summer Fun Band's catchy rendition of "Charm Bracelet."

Days of Mumble and More

www.mumbleboy.com

SINCE 1996, MUMBLEBOY.COM HAS SHOWCASED animation, music, photo stickers, and links to sites with similar sensibilities. In the *Whirl o'Purr* section, the animations are catchy and colorful, starring a cast of characters from Tape Recorder Man to Bunny Loafabread on a Sofabed. A personal favorite is All Girl Summer Fun Band. Most of the sound effects and music are provided by E*Rock, longtime collaborator on mumbleboy animations. As one third of the group Milky Elephant

(www.milkyelephant.com), mumbleboy advocates collaboration and supports other kindred artists.

mumbleboy will be making his first appearance at a film festival during the International Film Festival in Rotterdam, Netherlands. A CD, featuring songs by E*Rock and a mumbleboy animation collage, is in the works, but in the meantime, you can stop by the mumbleshop and stock up on mumbleboy t-shirts and dolls. Many enjoyable mumble moments can be found on this playful and thought-provoking site. —Beck Finley

Serving Your Webfilm Needs

AFTER HUMBLE BEGINNINGS

debuting back in October of 1998, IFILM now calls itself "The Place for Internet Film." The website, however, offers much more—industry insights, informative filmmaking articles, and webfilm news. It has been a hub that film fans, filmmakers, and industry professionals have been buzzing around for several years now.

Founders like CEO Kevin Wendle walk the walk, their bios overflowing with mentions of everything from Fox Television to CNET to ABC. Much of the staff has a background in TV and Web entertainment. It shows: IFILM presents an aura of something big and entertaining going on. Not to say that the suits are running the show. Far from it. The atmosphere is conducive to a creative community spirit, where each film even has a message board so that reactions can be up quickly and shared.



IFILM's staff actively searches for the best webfilms that the Internet has to offer.

The site has links to more than 15,000 Internet films—experimental, animation, reality, spoof, erotica, gay and lesbian, and sci-fi. IFILM also corners markets via such communities as women's film and teens. Rather than being on only the receiving end and getting submissions, the staff of IFILM actively seeks out the best films on the Internet, which makes sense if the company wants to make itself the ultimate film portal. IFILM claims to

have the largest library of films on the Net, and with its vast catalog, that claim looks to be quite true. The site features such high-profile talent as Rupert Wainright, director of *Stigmata*. His series of films, *The Sadness of Sex*, featuring *La Femme Nikita*'s Peta Wilson, are expertly produced, romantic shorts based on the book by Barry Yourgrau. Regular Joes are in attendance on the site as well, and IFILM often posts success stories about filmmakers who have posted their movie and then ended up working steadily in the field or signing a contract with companies such as Fox or CAA.

How does it come together? Jason Stewart, vice president of production and executive producer, says, "We started back in 1998 using only the RealPlayer with Surestream, but now, we offer several additional formats, such as Windows Media, Apple's QuickTime, and Macromedia's Flash. None of the formats is really more popular than the other; each has a healthy audience of users on our site. Each format has individual benefits, and accordingly, the staff favorites vary depending on what IFILM expert you ask. I personally alter my use depending on the type of film or connection speed."

As for submissions, the system is pretty much consistent. Stewart, also in charge of the encoding department, says, "Submissions are reviewed by the programming department, we can handle pretty much every format except actual film. Submissions are then sent along to the encoding department, and with a few exceptions, all of the processing is done in-house. The content is backed up to DV tape and logged into our tracking database. The material is then captured as QuickTime in uncompressed DV format. Once saved, it is then encoded in various formats and speeds, up to eight unique encodes depending on the content.

Currently we are using Terran's Media Cleaner 5 as well as RealProducer from RealNetworks to do the encoding. The encoded streams are then FTP'd to our video streaming providers. Once on the server, the content is then scheduled for launch on the site. It is then that the filmmakers are notified concerning their scheduled launches. The last step is launching the content according to our IFILM schedule. For the most part, the filmmakers themselves directly submit most of our content, but we also have an in-house team that scours the Web for inclusion into our comprehensive index of film. We have a great in-house editorial team led by Lew Harris, the founding editor-in-chief of Eonline.com"

IFILM looks to outside sources for streaming and storage because of the large amount of content. "Actual streaming is provided by one of several major streaming providers," Stewart says, "all with distributed networks and close-to-the-edge facilities. Currently, we have content being served by Akamai, Globix, and iBEAM. The streams are called and activated by our custom site application code that dynamically generates the requests."

Regarding technical support, Stewart says, "Most technical support requests are via email although we do publish our telephone number on the website. We have a full-time person who uses our tracking database to facilitate statuses of film submissions in process or log and correct any technical issues."

IFILM shows no signs of letting up, on their way to becoming an Amazon of online entertainment. With an appeal to a wide variety of users, the site produces and archives a huge amount of streaming video content, which keeps visitors coming back for more again and again. www.ifilm.com

Contributing editor Frank McMahon is a media artist specializing in directing, editing, animation, and graphic design. His work can be seen at www.fmstudio.com.

JVC shoots. Yahoo! streams.

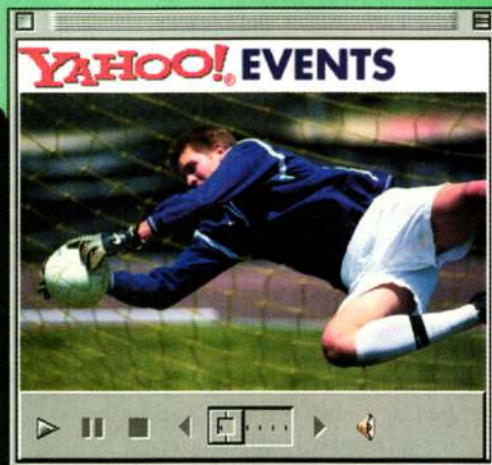
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According to Ric Choate, Studio Manager at YAHOO!, the decision was easy. "The physical design of the GY-DV500 is great. Controls are right where you'd expect. It's got professional, interchangeable lenses that can be controlled manually, three 1/2" CCDs and a 14-bit DSP—not to mention legendary low-lux performance. It even has bi-directional IEEE 1394 PC interfacing. More importantly, it allows us complete control over most camera parameters to produce shots with reduced image complexity and very low noise—issues that are essential when shooting for streaming. In the field or in the studio, it's a true professional camera...and we want nothing less. It simply delivers more than any other camera in its class."

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Beyond Television

TODAY, THERE IS MORE VIDEO ON the Web than ever, but content providers have quickly explored and perhaps exhausted TV's standard presentation style and seek the specialization and interactivity afforded by the Internet. Users simply want something they can't find on TV or at the movies, as evidenced by the number of online entertainment portals hosting new, independent, and amateur content. One such venue of increasing notoriety is Sputnik7.com, a New York-based online entertainment company that showcases new media in a dynamic and interactive format, aimed mainly at the 18- to 30-year-old crowd.

James Berry, vice president of creative technology for Sputnik7.com, says, "Our goal is to bring new and exciting content to our users – content that they may have a hard time finding anywhere else. We are always looking for new content that is high-quality but has yet to make it into the average person's living room."



Sputnik7.com, through an agreement with Manga Entertainment, offers full-length Anime features.

Launched in March of 1999, Sputnik7 initially focused on music videos but now has five main sections – *Video Stations*, *Video On Demand*, *Radio Stations*, *Free Downloads*, and *Featured Content*. Berry says, "Probably the most profound part of our evolution has been the expansion into Anime and film. We have recently formed a partnership with RES Media Group, which publishes RES Magazine and hosts the

international film festival RESFest. They provide programming for our *Film Channel* and *Film on Demand*, giving those features a unique voice and perspective that would only be possible by people who are an active part of the independent film community. We also have a relationship with Manga Entertainment, who distributes some of the best Anime in the U.S. To my knowledge, there is nowhere else on the Web that you can watch full-length Anime features."

Principal founders Chris Blackwell (founder of Island Records and Palm Pictures) and Ted Waitt (founder of Gateway) assembled a team of Morris Wheeler, Tom Grueskin, and Les Garland (one of the founders of MTV) to build the company. A staff of 45 now runs Sputnik7, about 22 of whom are hands-on technical people.

Deploying a project of Sputnik7's caliber, however, comes with its share of technical challenges. "The most difficult challenge in creating Sputnik7 was that our basic toolsets – other than our own technologies and database – and their corresponding SDKs were, in many cases, either in beta or had bugs in them that were critical for our implementation," says Berry.

Sputnik7.com uses Flash and JavaScript while supporting RealMedia and Windows Media players. Berry says, "We launched with RealPlayer 5. At the time, it had the best-looking codec and the most sophisticated toolset for expanded interactivity. Then Microsoft released Windows Media Player. The audio quality was impressive, so we decided to launch Sputnik7 Radio using Media Player and RealPlayer G2. That led to the inclusion of Media Player in our *Video on Demand* section, and consequently, the entire site, except for the *Video Stations*. At this point, there is no video player other than Real that has the tools to allow us to easily incorporate it into the *Video Stations*."

Additionally, Berry says, "Many of the filmmakers are requesting that we use QuickTime and are not concerned with the possibility of piracy. We will probably be watermarking these files as a precaution."

The preparation of the video before compression for the Web is all done in-house. Says Berry, "We use a Media 100 and capture directly to a 1TB RAID system via Fibre Channel and compress with Media Cleaner Pro and the native Real and Windows Media tools. We generally encode from BetaSP and use a component signal, rather than S-Video or composite. We use a 3:1 compression ratio, the least amount of compression you can have with most systems and do not use any other compression between that and the final codec. We also color correct before capture and after, if necessary. We send the audio through a high-end compressor and then normalize it, to help balance out the differences in volume between videos."

The backend that drives Sputnik7 is complex. "We needed to create dynamic, database-driven pages. Because our needs were limited, and we did not want to spend a large amount of money on a publishing system, we decided to go with JSP. That allowed us to choose our server environment (unlike using ASP), and integrated well with our existing, JAVA-based systems," Berry says.

Despite the current hostile climate for Internet businesses, Sputnik7's user base continues to grow. "Expect more community and personalization," adds Berry. "Sputnik7 will also offer many powerful features, for users who want it, and will become as simple as turning on a TV for users who just want to watch a video or listen to music. Our content offerings will continue to grow and will be updated even more frequently."

Fred Pilgram is a freelance multimedia consultant based in Kansas City, MO.



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The Future of Radio

LAUNCHED IN 1999, LIVE365 (Foster City, CA) provides the tools and bandwidth for its 24,000 broadcasters, ranging from professional and amateur disc jockeys to businesses and corporations, to reach thousands of listeners by broadcasting from Live365.com. With 1.7 million unique visitors each month, Live365.com fills a unique niche in the broadcasting world. "With regular radio, you're limited to hearing what's available on your terrestrial dial, but at Live365.com, you can listen to more than 24,000 stations from around the world," says John Jeffrey, Live365's executive vice president of corporate strategy and general counsel. "You're no longer limited to what's being broadcast in your area."

For professional and amateur broadcasters alike, Live365 provides a way to stream audio to listeners around the globe. For corporations, the service provides a way to broadcast a message and attract new customers. "Companies also use the service to add audio to their webpages, so they can set a mood for their brand," Jeffrey says.

There are numerous companies in the Internet radio field — Broadcast America.com, LAUNCHcast, Kerbango, and Sonic Box — but only Live365 provides the tools to broadcast from Internet radio stations. Live365 broadcasters provide

their own audio content, but the broadcasting service, which includes up to 365 live, simultaneous MP3 streams, 365MB of server space, a listing in the Live365 directory, and revenue sharing for e-commerce sales and advertising, is free to individuals. Organizations can sign up for Live365's Private Label Radio (PLR) service, which comes in two packages: Basic and Premium.



Become your own DJ with Live365.

The Basic package targets religious, political, governmental, and educational groups, such as non-profits; public radio stations; and club DJs. It includes from 25 to 200 live, simultaneous MP3 streams and a branded tuner that launches from the broadcaster's website that posts the organization's logo and a text box for a description of the broadcast or other information. The package also includes a listing in the Live365 directory, access to a private Audio Administra-

tor page that tracks the audience, and revenue sharing for e-commerce sales and advertising. The one-time setup fee is \$150, and the monthly fees range from \$60 to \$375, depending on the number of streams and the minimum listener-connection speed.

The Premium package is designed for commercial and college radio stations, businesses, and other groups expecting to reach a large audience and/or generate lots of

revenue. This package offers the features of the Basic package, plus an additional 135MB of storage space, an option for banner and audio ads, and 365 live, simultaneous MP3 streams. The one-time setup fee is \$1,000, and monthly fees range from \$450 to \$750, depending on the minimum listener-connection speed. Additional options for both packages are available for nominal fees.

Because Live365 is privately held, revenue details aren't available to the public. According to Jeffrey, however, the company makes money through fees garnered from sales of its PLR packages. It also sells audio ads on its site and offers an online store where listeners can purchase music. "Eventually, we'll provide links to other sites selling merchandise — books, concert tickets, and other goods related to the content you're listening to,"

Jeffrey says. Using proprietary technology for tracking, Live365 pays royalties to musicians and record companies featured on its network.

In September, Live365 launched a streaming MP3 player for the Windows CE platform. "With this wireless streaming product, we're showing that Internet radio can be broadcast from not just a stationary computer, but also from mobile phones, PDAs, and car stereos," Jeffrey says.

Wanda Meloni, principal analyst at M2 Research (Encinitas, CA), agrees with Jeffrey's view of the future of Internet radio broadcasting, but adds that Internet radio most likely will coexist with, rather than replace, terrestrial radio. "Live365 is providing a new, interesting medium, but the old medium won't go away," she says.

As such, Meloni adds that Live365 will have to do two important things to remain a leader in the Internet radio space. "First, they'll have to sustain this concept of creating a community presence, as that's one of the top attributes an Internet site can provide, and that's how the company will be able to continue to provide something that's truly unique and different from current technologies," she says. "Second, they'll have to make sure they partner with key affiliates and technology vendors. This will help them stay ahead and prevent bigger companies from taking their lead position." □

Audrey Doyle is a freelance writer based in Boston.



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BY JEFF SAUER

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PACKETVIDEO CORP.

www.packetvideo.com

Leader of the Pack

OUT OF A HANDFUL OF forward-looking companies that are developing MPEG4 software tools for low-bandwidth video streaming, Packet Video is charting a unique course. The San Diego-based company is strictly focusing on enabling MPEG4 to wireless devices, such as PDAs and cellular phones. Many MPEG4 proponents look forward to this potentially huge market, but few software companies have specific solutions for opening up the market. It's not surprising, therefore, that Packet Video's expertise has caught the attention of several prominent companies who are now partners and investors.

MPEG4, targeting media bit rates from 100Kbps to 1Mbps, was developed for Internet video and wireless distribution. With MPEG4, decoding devices can respond to server queries about available bandwidth, allowing the server to scale back frame rates or resolution as necessary in order to supply a playable

stream to any compatible device. Packet Video relies on this technique for its PVServer, PV Author, and PVPlayer software products.

The ace up Packet Video's sleeve, however, is proprietary error resiliency, ensuring the data integrity of a video stream. Dr. James Brailean, Packet Video's cofounder and current president and chief technology officer, has chaired the MPEG Committee's Error Resilience Video Compression Ad Hoc Group for the last four years. As such, he offers his expertise on implementing error resiliency and also positioned Packet Video to enable solid video transfers over the otherwise tenuous bandwidths of wireless infrastructures.

The Next Generations

At 14.4Kbps, Second Generation (2G) wireless bandwidths are the eye of the needle for the veritable data camel of digital video. Remarkably, even though more than half of that

bandwidth is needed for speech, Packet Video's technology can make acceptable some very low-motion video. Packet Video admits, however, that it looks forward to the improved wireless bandwidths of the so-called 2.5G that should boost bit rates to 48- to 64Kbps or higher.

The transition will not be immediate. This year, Japan, the Far East, Finland, and other European countries, likely to move more quickly than the United States, will present the first opportunities for Packet Video's products. There are even plans for a Third Generation (3G), enabling DSL-like bandwidths and requiring major hardware infrastructure changes that will take much longer.

Packet Video is already a step ahead of the competition that will inevitably emerge as products and infrastructures mature. Few video companies are focused on the wireless space, although Geo Interactive already has relationships with Erickson and Nokia, based on a proprietary rather than standards-based compression technology. Recognizing this potential distinct advantage, Geo has announced plans for an MPEG4-based solution, though it appears to be a step behind Packet Video.

RealNetworks and Microsoft are vying for streaming format supremacy over the Internet, and as wireless matures, they may ultimately represent a bigger threat to Packet Video. Like Geo, both favor proprietary compression formats, and their sheer size could

squeeze the MPEG4 companies to the fringe. On the other hand, both RealVideo and Windows Media have infrastructures that support third-party compression formats like MPEG4, leaving an opening for companies like Packet Video.

Products and Investors

Many of Packet Video's employees already carry PDAs that receive video, and another favorite application is the nanny-cam, allowing parents to watch their children's activities. Actual commercial products, however, will require a deliberate commitment from technology companies, cell phone and other wireless device makers, wireless carriers, and content producers.

Packet Video has assembled an impressive coalition of backers, including companies from each of those critical groups. Still a privately held company, Packet Video was initially funded by founder and angel monies, but now boasts an impressive slate of corporate investors that began with Intel and Siemens in June 1999. The list now includes mobile hardware makers Motorola, Qualcomm, Texas Instruments, and Philips; Internet and wireless infrastructure companies Akamai and Finland's Sonera; content companies Sony, Time Warner, and Reuters; and the investors First Boston and the Rockefeller Foundation. □

Jeff Sauer, contributing editor for *netmedia*, *Video Systems*, *Presentations*, and *NewMedia*, is the Director of the DTG Group Lab in Cambridge, MA, an industry research and product-testing organization.

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Motorola and PacketVideo announced that they will collaborate to bring full-motion video and audio content to mobile devices, including Internet-enabled wireless phones, smart phones, handheld devices, wireless personal digital assistants, and laptop computers.

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www.packetvideo.com and www.pv.com showcase Packet Video's breakthroughs in MPEG4-compliant technology.

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THE FACTS OF LIFE FROM THE WEB'S

SEXIST CEO

From credit card fraud to business models, Danni Ashe talks candidly about the issues that separate the successes from the failures in the online content world.

THE PLAIN BEIGE OFFICE BUILDING ON A SIDE STREET in one of Hollywood's more industrial areas gives no hint that anything unusual is going on inside. Like so many other similar looking buildings, it sits demurely in anonymity. Even when the receptionist buzzes you into the front lobby, there are few clues that you've just entered the home of Danni's Hard Drive. The tastefully decorated offices and neatly arranged cubicles suggest only that you may have wandered into the offices of a legal establishment, or maybe an accounting firm. It's only once you pass beyond the receptionist's desk and the front office area and peek into one of the five

studios in this 5,000-square foot facility where various props, like the zebra-blanket covered bed, sit, or into the wardrobe room, where collections of costumes and risqué lingerie are kept, that you can say to yourself with certainty that, yes, this must be where the Most Downloaded Woman in History works.

Danni Ashe, 32, stole that title from Cindy Margolis last year when the *Guinness Book of World Records* accepted her claim that her image had been downloaded more than 840 million times between February 1996 and June 2000. Margolis has since appealed the verdict, and a recount of sorts is on. For now the title is split, with Ashe still



Russell Baer



Russell Baer

holding the title for a pay site and Margolis holding it for a free site. Ashe, however, is confident that in time her claim to the full title will be upheld. (See www.mostdownloadedwoman.com for details.)

It's an impressive accomplishment for a former exotic dancer who, just six years ago, had only a desire to change careers, a budding interest in computers, and a vague idea about the potential of the Web.

We find the average consumer is just not able or willing to deal with downloading and configuring a new player every six months.

More impressive is the \$6.5 million, 42-employee strong business she's since developed after first teaching herself HTML coding from a book while lying on a beach. Today, her site gets more than 125,000 unique visitors a day and reportedly uses more bandwidth than all of Central America.

Nearly 40% of her site members come from outside the United States.

She's one of the only woman CEOs in the fast-growing online adult entertainment field, and although her revenues may be small compared to the more than \$1 billion in revenues generated by the industry as a whole, there's no

denying that she has single-handedly carved out a unique and highly profitable brand in the fiercely competitive adult entertainment world – and she's only just getting started. Her plans for the future are big.

Personable, bright, and articulate, Ashe is far more than just another pretty face. She has a shrewd business mind and a keen understanding of what it takes to succeed in the online world. She's been interviewed by countless publications, including the *Wall Street Journal*, and has appeared on numerous television shows, including Bill Maher's *Politically Incorrect*. She's become a spokesperson of sorts for not only the online adult entertainment industry, but also Web businesses in general. While mainstream entertainment sites are dying, Ashe's softcore site is thriving in a hardcore world. She has a deep understanding of the pitfalls and challenges involved in running a Web content business, and anyone dreaming of success in that arena would be well advised to heed what she has to say.

netmedia: Tell me a little bit about what your site was like when you launched it in July 1995 and how it has evolved over time.

Danni: The original idea was just to make it an extension of my own fan club, which was about merchandising – videos, autographed pictures. And I took that just a tiny step further in that I offered information about other girls that I knew. And I offered videotapes from companies that I had befriended in my years of modeling. So initially it really was just like an enhanced, expanded fan club, and the business model was video sales.

And then I began putting up a lot of fun stuff, like the picture of the week and various different pieces of content. But basically I'd put up the content and then take it back down because I didn't want to chew up too much bandwidth. It was too expensive. But then I had a lot of

people writing me saying they would pay a fee if I would leave that stuff up there so they could get it any time they wanted it.

netmedia: And you were running this all off your own computer out of your house, initially?

Danni: No, I got an ISP in Orange County to host me.

This is actually a funny part of the story. I had finally zeroed in on the ISP I wanted, and I was looking at his pricing structure, and I had him on the phone, and I said, "You know, I think we need to talk about having a dedicated server." And he goes, "Oh, now, now, now, don't get ahead of yourself. We'll just put you on the public server. You'll be just fine."

I said, "You know, I've been talking to a lot of people, and I think I'm going to get a lot of traffic." And he says, "Oh, no, don't you worry." The day that we launched, we crashed his public server. And he calls me up in a panic, "Oh, my God! Oh, my God! You got 80,000 hits from Slovenia! So we pulled you off the public server and put you on your own box!"

netmedia: But initially the site was just photos and text and some merchandising?

Danni: Yes, but six months into it, I had all these people saying they would pay a subscription fee if I would leave this stuff up. And so I hatched a deal with a magazine publisher to provide a whole lot of content. In my mind, I thought, "Oh, I'll make this little subscription site that'll just kind of run in the background, and then I can use all this content to supplement and enhance my video catalog," because I'm still thinking my business model is to sell videotapes and fan club merchandise.

So I launched this pay site. I worked and worked on it, building it up and building this much larger video catalog with the content. I slaved away, like 12 to 14 hour days, and I put it up at 8 o'clock, January 31, wiped my forehead and said, "Whew, now I can relax." And I went out to dinner with my husband.

When we came back, I checked in, and I'd sold 50 subscriptions! I was jumping up and down going, "Oh, my God. I can't believe it. I can't believe it. This is incredible." And then my husband and I looked at each other and went, "Oh no, now what do we do?" because I hadn't automated any of it. I didn't expect it to be anything. I thought maybe we'll sell five subscriptions a day. So we were getting the orders by email, and then we had to print them out, type them into the database, type them into the password system, type them into the credit card processing software – it was a nightmare.

So then I was desperately hiring people. I would hire anyone that could spell their name. I was teaching people how to use a mouse. Anything to get bodies in to type the data into the databases. It was ridiculous.

netmedia: Then you added streaming to your site in 1997. How'd that go over with your audience?

Danni: Initially, it didn't have that much of an impact on me because most of the people were on 28.8[Kbps] connections, and they couldn't have a satisfactory video

experience. The value of Danni's Hard Drive content is the humor and the personality of the girls, and I wasn't producing any video content myself. I was just making various syndicated feeds available. Video didn't really become a big deal for us until maybe in the last year and a half. We took the step of starting to produce our own Danni-branded video content about two years ago. It started with the "Boob Bowl," which was a big hit. That's really when it started to take off for us.

netmedia: From a business perspective, how has video enhanced your business?

Danni: Well, my bandwidth bills are a lot bigger. (Laughs)

netmedia: Any positive cash flow results?

Danni: Well, yeah. I mean, the website is obviously much more comprehensive and a lot more valuable. We can charge a higher subscription fee because we offer a lot more content.

netmedia: The quality of your video is actually pretty impressive, better than what you often see on such big name sites as NBCi or CNN.com. Is there something



Julie Strain

about the way you produce your video or the tools you use that allows your video to come out so well?

Danni: Well, our facility is 100% digital. So when we're streaming live, there are no analog components, which in the end, results in a clearer picture. When it comes down to compressing that image to be able to push it through the Internet, it's going to look a lot better if it's never been analog. So that is a big plus.

You have to figure out what people want, and you have to sell it to them as quickly and as efficiently as you can. And I think in the mainstream Internet world, that's kind of been lost.

netmedia: And you also use a proprietary, in-web video player, which you call DanniVision. Why do you do that when you could be using QuickTime or Real or Windows Media Player?

Danni: Three reasons. One, we were unsatisfied with the quality of RealVideo. Two, we find the average consumer is just not able or willing to deal with downloading and configuring a new player every six months. And three, it was cost. If you want a 10,000-stream license from Real, it costs half-a-million dollars a year, and we don't have millions of dollars of investment money behind us. So that just doesn't make sense. We can't see the value in paying half-a-million dollars for their technology when we could develop our own that our customers would be happier with anyway.

netmedia: But you do offer some Real streams on your site.

Danni: We do, but only in small amounts. Only for things where the audio is really important. In Real, the audio is way ahead of the video. I think the video quality is better on DanniVision, though it depends on your connection. DanniVision is geared to high bandwidth. If you're trying to watch it on 28.8[Kbps] with sound, it's going to be lame.

netmedia: Is it difficult to be responsible for developing your own player? I mean, here's Real, dedicated to creating quality players. Isn't it difficult to create a player that's going to give the same kind of quality?

Danni: Well, DanniVision is constantly evolving and getting better every day. And it doesn't cost us half-a-million dollars to do it. And it offers our customers an option. For those people that are sitting on a cable modem

or DSL, they're going to have a better experience. They're going to get clearer, better video. And for those people that just don't want to fool with the plug in, they're not going to have to.

netmedia: All right, let's talk about the money side a bit. What are the biggest revenue generators for you?

Danni: Subscriptions, far and away. We still do some merchandising. And we're beginning to offer hosting and credit card processing services to other websites. That is really the big growth business for us, right now.

netmedia: Tell me more about that. What is that business, and what is the opportunity?

Danni: Well, in late 1999, early 2000, we had a real crisis in the credit card banking system. You see, right now the only widely adopted payment system on the Internet is credit cards. But all the credit card processing systems are built to service a face-to-face transaction – where you swipe the card, you get the signature, you look the person in the eye and check their ID. There are a lot of protections built into the face-to-face transaction that tell you, "Yes, this is the card holder." And then, it goes to the credit card processor, which will then do a negative check rather than a positive check. It will only check to see if that card is bad. Is it stolen? Is it over limit? If the card's not bad, it must be good, and the charge goes through and you happily walk out with merchandise.

On the Internet, especially when you're selling a digital





Russell Beer

product, a lot of those protections of finding out whether we are dealing with the card holder are now gone away. You send the transaction out to the credit card processor, it says, "Oh, not a bad guy, go ahead and take it, he's approved." And then you'll find out, three or four weeks later that the credit card number was never assigned or was stolen, and we have no recourse. Because as far as VISA is concerned, it's our responsibility to find out if they are the actual card holder.

So there are these big holes in the system where online merchants are being as diligent as they can be, yet they're being failed by the system because they assume they are taking good cards. Only later do they find out that the card was generated with credit card generator software from a hacking site and that the number, while it is valid, has never been assigned to a card holder. So as an industry, we have these huge, huge problems with fraud. And that's everyone across the board. Everyone. But the adult industry is the one that's doing huge volumes in digital merchandise. We're the only ones that are selling digital video in a real way. Lots of people like Amazon are selling merchandise, but we're selling a digital product in a large way. So VISA looks at it and goes, where are all these charge backs coming from? Oh, they're coming from the adult industry.

netmedia: But why isn't Amazon.com having lots of charge backs as well, even though they're selling real products?

Danni: Because you at least get a mailing address from someone when you're selling physical merchandise. It's not like they can take your product and disappear. You at least have a trail. You know where you shipped the merchandise. So it's a little safer. Mail order is still more risky than face-to-face, but it's safer.

So anyway, here we are. We know that software companies that sell software online have charge-back ratios just as high if not higher than us, but they're not doing the huge kind of volume that we are. So as an industry, we were pretty much targeted at the end of last year. They laid down some very stiff regulations and really high fines. And there were people who paid millions of dollars in fines. And most of the adult businesses took their business offshore. The vast majority of adult merchants now process offshore.

We did the opposite. We sort of circled the wagons and applied the resources of our company to finding ways to patch the holes in the fraud. So we've built these really elaborate systems for identifying fraud and stopping it. As a result, we've gotten our charge backs down to .005%, which is incredibly low. Incredibly low. And we now are offering that service to other people.

netmedia: You've also talked about the problem of charging very small amounts of money online. Is that still an issue?

Danni: That is still a problem, yes, because when you get a merchant account, they want to know what your average ticket's going to be. If you tell them your average ticket's going to be \$1, they're going to say, "No, sorry, it's not

We're beginning to offer hosting and credit card processing services to other web sites. That is really the big growth business for us, right now.

worth our while." And it's not going to be worth your while as the merchant either because the fees they're going to charge you per transaction are going to make it unfeasible. So you're really kind of forced to charge at least \$10. And so, you're stuck. You have to aggregate a lot of content and try to get people interested in that aggregated piece of content at that higher price. It's much like what HBO does or Showtime does. They say, "Hey, we have this huge lineup of programming that you should be willing to pay this much a month for." And that's our only option. We don't have the option of saying, "Well, if you just want this one video, or this one photo set, you can pay me 50 cents for it." It would be like walking into a drug store to buy a tube of toothpaste and having them say, "No, I'm sorry you have to spend \$20 in this

(Continued on page 84)

BY CLAUDIA KIENZLE

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WINDOW TO YOUR SOUL

VIDEO SHARING TECHNOLOGY IS REVOLUTIONIZING
THE WAY WE COMMUNICATE WITH ONE ANOTHER.

ON NEW YEAR'S EVE, ALONZO VINCENT

in Ontario was able to share the midnight countdown to 2001 with his new girlfriend, Laura, thousands of miles away in Minnesota, by using webcam cameras on their PCs, and video sharing software to produce high-quality, live videostreams over the Internet. First, Alonzo and Laura rang in the New Year in Ontario, and then an hour later they met online for midnight in Minnesota.

Sending video over the Internet, or media streaming, is not new; it is a technology that, until now, has only been affordable or accessible by large corporations, organizations, and media outlets. A new breed of software and hardware for personal video sharing, however, is making media streaming easy and affordable for anyone with Internet access.

Video sharing is an exciting, emerging trend that promises to revolutionize the way we communicate with family, friends, and business associates. Many ASPs and online communities are now offering proprietary video sharing software tools and online storage, often for free, including Eyeball Chat, POPcast, iClips, SpotLife, and VideoShare.

Live video sharing requires users to connect a video camera, either a webcam (starting at \$39.95) or digital camcorder, using either a fire wire or USB connection, to their PC. Canned video can be uploaded onto the Web from storage devices like a VCR or hard drive.

Broadcasting Real Life

Broadband connectivity, such as cable modems or DSL, is vital for

streaming and watching full-motion video in real-time, with quality comparable to the TV-viewing experience. With live video sharing, two or more parties can see each other's facial expressions and body language, making the conversation more natural and the communication more effective. Despite geographic separations, families can watch a PC screen or, eventually, a wireless Internet device to witness a baby's first steps, a student's college dorm room, a child at the daycare center, or a birthday party.

While broadband connectivity is prevalent in the business community, most PC users are still restricted by narrowband – 28.8Kbps and 56Kbps dial-up modem – connections. For this reason, many video sharing services use proprietary compression, buffering, and other distribution methods that allow narrowband to handle the demands of video. In addition, instead of live streaming, video can also be sent like email, either attached to the message or as a link to the website URL where visitors can view it.

Industry experts predict that greeting cards, birth announcements, classified ads, online auctions, real estate listings, and email soon will routinely include moving video clips; not just text and still photos.

"Let's face it. Don't we all want to look at the person on the other end and see into the windows to the soul – their eyes? Also, don't we want to really see if that person truly is who they portray themselves to be?" asks Vincent. "Eyeball Chat made that happen instantly for me and Laura, and instead of \$3,000 per month telephone bills,

The closest thing to being there: the USO and Logitech helped this military man connect with his wife and newborn son, Chance, through Operation Deliver America.

the only expense is the fixed monthly Internet service fee."

Eyeball.com Network, the maker of Eyeball Chat in West Vancouver, Canada, is now expanding its software line to include Eyeball Chat Full Version, which allows multi-party video chats for a small monthly service charge. In the Spring, it will release Eyeball Chat Server, a B2B solution that enables enterprise-wide private video communications via Internet or intranet; and Eyeball Chat SDK and Eyeball Games SDK, which enable developers of PC, Web, and game applications to add Eyeball chat to their own websites or game software. When used with Eyeball Chat Server, video of company representatives can be added to websites and gamers can be added to online games.

The Best Show in Town

When the U.S.S. Cole was attacked in fall 2000, many U.S. servicemen could not take personal leave for some time following the incident. This was disappointing news for one midshipman stationed in Taszar, Hungary, who planned to go home to North Carolina for the birth of his son, Chance. The event was particularly momentous to this couple because their first son had died of liver disease, and they had had difficulty having a second chance for their family until the new baby arrived, thus, the name Chance.

Operation Deliver America, however, made it possible for the couple to see each other, and for the serviceman to see his son for the first time, using real-time video streaming. Unlike photographs or a phone call, the serviceman could see and hear his wife and baby interacting.

Through a partnership between the USO and Logitech, the Switzerland-based maker of the QuickCam Internet video cameras, PC cameras were installed at more than 100 USO facilities around the world, assisting the USO in its mission to extend a touch of home to active-duty American military personnel. The installation included free personal video broadcasting services and technical support from SpotLife, in San Mateo, CA.

"The response to this program has been absolutely overwhelming," says General John H. Tilelli Jr., U.S. Army

(Ret.), now president and CEO of the USO. "Video technology far surpasses traditional means of telephone and mail when it comes to bridging the distance between service personnel and their loved ones, and we're grateful that they can communicate in this manner."

SpotLife (www.spotlife.com), owned and funded by four venture capital firms and Logitech, offers channels on which to broadcast for free personal video, including travel, chat, romance, pets, lifestyle, college, and spirituality, with point-and-click ease. Using channels from a pull-down menu, you can watch user webcasts and videos, for example, Abby Smith in her college dorm room; Midshipman Jonathan from his living quarters at the U.S. Naval Academy, a view of a train yard from a Parisian's window, and even password-protected videos for mature audiences.

"Because of the simplicity of our product, the power of our technology, and the reach of our distribution, we believe SpotLife software is uniquely positioned to build the market for Personal Broadcasting and capitalize on the value of that market both as a communication and entertainment medium," says Amit Goswamy, cofounder and president of SpotLife. The site, which is advertiser-supported, offers free broadcasting, 15MB of storage, and 240 live streaming minutes per month, with a maximum of 25 simultaneous viewers. SpotLife expects to support more than one million personal broadcast shows within the next two years, with more than 20 million viewers worldwide.

No Such Thing as Free?

Many video sharing companies boast that they let consumers download their software and use about 20MB, about 20 minutes worth, of online video storage for free. Mike Wilson, vice president of business development for POPcast, a Los Angeles-based, leading Application Service Provider (ASP) in the self-service webcasting market, doesn't feel that giving away the store, however, is a viable long-term strategy for any company. Wilson predicts that within a year, businesses based solely on a consumer model will likely fall by the wayside due to insufficient revenue.

Because POPcast allows users to download tools such as media players

for free, its business is largely supported by the licensing of its comprehensive, multimedia-authoring solution by Internet business partners. Rather than directly targeting end-users, POPcast has refocused its marketing to help business customers better serve their end users.

"POPcast is devoted to making video sharing easy and accessible to all Internet users, but our business strategy is primarily to partner with major Internet portals – like Lycos, British Telecom's BT Open World, FoxKids.com, Ulead.com, and NBC-i.com – to enable them to incorporate customized, branded, POPcast-based, video sharing solutions within their popular Internet destinations," says Wilson.

The Company You Keep

In hopes of becoming the standard in video sharing, POPcast formed partnerships with Intel, Microsoft, Cisco Systems, and other PC system vendors, as well as JVC and Sharp, makers of consumer video equipment, including webcam camcorders. POPcast's POPcaster software combines its own proprietary video capturing and automated video publishing technology with Intel's Easy Web Media complete multimedia-authoring technology. The deal with Microsoft makes POPcast video sharing and publishing software part of Microsoft Windows MovieMaker, a consumer desktop video production feature in the Windows Me OS. Also, in August 2000, POPcast was infused with \$10.8 million in venture capital from Intel Capital and Telesystem Ltd., which will finance expansion of its marketing and research and development initiatives.

POPcast wants more business partnerships like the one it now has with FoxKids.com, a fast-growing online destination that offers kids, ages six to 14, adventure-driven action entertainment. In June 2000, POPcast developed a customized version of POPcaster solely for FoxKids.com and renamed it the FoxKids.com Movie Studio to reinforce the channel brand identity.

From within the FoxKids.com website, kids have an all-in-one tool for capturing video – using Webcams,

The Video Sharing Market

Since personal video sharing is a new trend, its size and potential have not yet been fully analyzed. Vendors of video sharing services, however, offer some research statistics as evidence that the market is ripe for video sharing technology:

99% of Internet users use email; 66% use electronic greeting cards; 58% chat online; 54% have personal homepages; and 44% use message boards. (Jupiter Communications as cited by iClips)

57.2% of Internet users already watch video clips, and 7.3% actually edit video clips on their PCs. (home PC survey by PC Data as cited by POPcast)

13% of U.S. Internet households already have a PC webcam, seven million webcams shipped by 2000, and more than 26 million more will ship by 2002. (InfoTrends Research Group)

182 million Internet users use email, 91 million use instant messaging, and 65 million use online, PC, and console games. (Eyeball Chat)

Within five years, 92% of online consumers will use some form of personal rich media at least once a month. By 2000, more than 11 million PC cameras were sold, with an estimated 50 million more by 2003. By 2001, 78 million camcorders and 38 million digital still cameras, supporting video, will be sold.

By 2004, virtually every digital camera will have the capability to capture short video clips. By 2002, 21.3 million households are expected to have broadband access. (Lyra Research as cited by SpotLife)

In 2002, revenue from webcasting services – content creation, broadcasts, software and hardware – will reach \$1.59 billion, up from \$217 million in 1999. (Convergence Consulting Group as cited by SpotLife)

More than five million Internet video cameras have been sold by 2000, and 50 million more are expected to be sold over the next three years. (International Data Corporation)

Within five years, 92% of online consumers – 57% of U.S. households – will use some form of personal rich media at least once a month. (Forrester Research as cited by SpotLife)

U.S. firms using streaming media on their websites will grow from 17% at present to 47% in 2001. (Gartner Group)

By 2004, 16.6 million households are expected to have broadband access. (Yankee Group)

An estimated 28 million U.S. households will have broadband connections by 2003. By 2004, video email or pointers to rich media content will replace text messages as the main online communication mechanism. (Forrester Research as cited by VideoShare)

to an iClips account page on the iClips site, put on any HTML-compliant website, or sent like an email message from your iClips address book. Message recipients can see the video message in email or click on the link that was sent to them to play it from a website, eliminating time-consuming downloads by narrowband users and caching big files on hard drives.

"iClips empowers Web users with a free, easy-to-use service that dramatically improves their ability to communicate by incorporating streaming video with text. It could be a rich-media Valentine for a friend; a video posting about an item you're offering for auction; or any message best said with the impact of video," says Michael Diamant, founder and CEO of iClips, which has received \$5.4 million in venture capital funding since its inception in 1999.

Not everything at iClips is free. The site offers users the opportunity to upgrade to iClips Pro, a \$9.95 per month service that offers 100MB of online storage and an encoding and delivery bit rate of 256Kbps versus the basic service's 56Kbps, which maximizes broadband connections. Similar to POPcast, iClips has formed business partnerships with major Internet destination sites, including NBCi.com, Homestead.com, and theglobe.com, to make iClips technology accessible from within the portals.

NBCi.com has put the streaming message capability inside a section called "My Video Center" where users can add video to classifieds and personalized communications. "We are committed to delivering broadband solutions that enhance our members' online experience," says Josh Mailman,

digital camcorders, and VCRs – and for adding text, stills, and audio. Finished presentations can be uploaded to password-protected accounts on FoxKids.com for instant sharing with family and friends around the world via POPcast's distributed global streaming media network.

files from VCRs or hard drives, and these files are then converted into a streaming format called iclips. The iClips player is based upon RealNetwork's RealPlayer, the most widely installed media player on the market.

The resulting iclips can be published

Revolutionizing Email and Websites

For anyone wishing to create and send a video message, NY-based iClips (www.iclips.com) promises that its proprietary software tools and 20MB of online storage are free. With iClips, there is no desktop software to download: the iClips Producer video-creation tool runs within the Web browser. Users can either create their own messages using webcams and camcorders or upload existing video

A partnership between iClips (left) and NBCi.com (above) keeps the technology affordable and accessible.



Lycos (left) and Blue Mountain (right) offer video sharing technology and opportunities.

vice president of product at NBCi, in NY. Homestead, a site offering online website creation tools to more than eight million registered members, now integrates iClips tools so they can add videos to enhance their personal and small business websites.

iClips are distributed at optimal quality by Akamai Technologies, which offers FreeFlow streaming service. "Individuals are now able to take advantage of Akamai's intelligent routing and high-performance, global network of 4,500 servers – a technology previously only afforded by corporations and Internet broadcasters," says Diamant.

Strong Partnerships

In 1999, VideoShare (www.videoshare.com) began as a destination site where individual users could create and upload video for friends and family to watch. "Last year, we realized that a strictly consumer model was not the right strategy going forward. Instead what we've done is to pursue an ASP strategy where we empower our partners, including Lycos and Blue Mountain, and they in turn offer our video sharing tools from within their popular Internet environments. We feel this convenience makes our technology more attractive to end users," says J. William Rutherford, vice president of product marketing for VideoShare (Watertown, MA).

"Since people already go to Blue Mountain.com to send electronic greeting cards, it seemed natural for Blue Mountain to offer the ability to upload and send video clips, especially of events and occasions like weddings and graduations," says Rutherford. "While some users still sit in front of their webcams and terminals, others have become rather sophisticated, moving beyond the tether of the

webcam wire to shoot and edit videos of special events, like local bands performing and what they did on their vacations."

Designed for Video-On-Demand, the VideoShare solution includes VideoShare Producer for video capture; video hosting and storage using VideoShare's high-performance, scalable network, capable of handling more than a billion unique streams per month; and video streaming, using Windows Media player technology. Both Lycos and Blue Mountain specify Windows Media Players, rather than offering a choice, simplifying the complexity for the end user. VideoShare is included with Window's Millennium Edition's Windows Me OS, in the new Windows MovieMaker feature.

In addition to receiving more than \$5 million in venture capital, mostly from Scripps Ventures, VideoShare sustains itself through the licensing of its software, or a combination of software licensing and revenue sharing arrangements, with major Internet portals and sites.

Rutherford says that VideoShare is seriously considering video sharing using wireless technology. "Our theory is that wireless technology is becoming a popular way for people to communicate and manage their daily

lives. So, there's great potential there. If you're transferring video data from a PC into a wireless Internet device, then the playback can be relatively straightforward, but a wireless transfer of a significantly large video file still presents challenges," says Rutherford. "We feel that wireless video sharing is not that far off, maybe within three years, but we will wait until we can ensure a positive user experience."

Future Shock

Video sharing providers are confident that streaming personal videos over the Internet is a revolution that will change and improve the way we live. Although streaming media has enjoyed most of its success in the bandwidth-rich corporate environment, as broadband connectivity becomes widely available to the public, there will be an explosion of demand for personal video sharing. "Because it [video sharing] will be so relevant to people's lives, it will be readily accepted the way email and instant messaging has been," says POPcast's Wilson.

To promote the Internet lifestyle of the future, Cisco Systems has incorporated POPcast applications – POPser Live Video, POPcast Video Mail, and Mobile Video Services – into its Internet Home Briefing Center, a model home that illustrates how always-on, broadband Internet connectivity can enhance every aspect of home life. Aside from practical applications, such as monitoring the home while on vacation, live, broadband video sharing promises to connect families and friends around the globe using video and audio so they can share momentous occasions, like birthdays and anniversaries, right from their living rooms. ☺

Claudia Klenzie is a freelance writer specializing in digital video.

Website Directory for Video Sharing Vendors

AlwaysonTV.com
www.alwaysontv.com

Blue Mountain
www.bluemountain.com

Dazzle Multimedia
www.dazzle.com

iClips, Inc.
www.iclips.com

Digital Media Works
www.videomailstudio.com

Eyeball Chat
www.eyeball.com

Javu Technologies, Inc.
www.javu.com

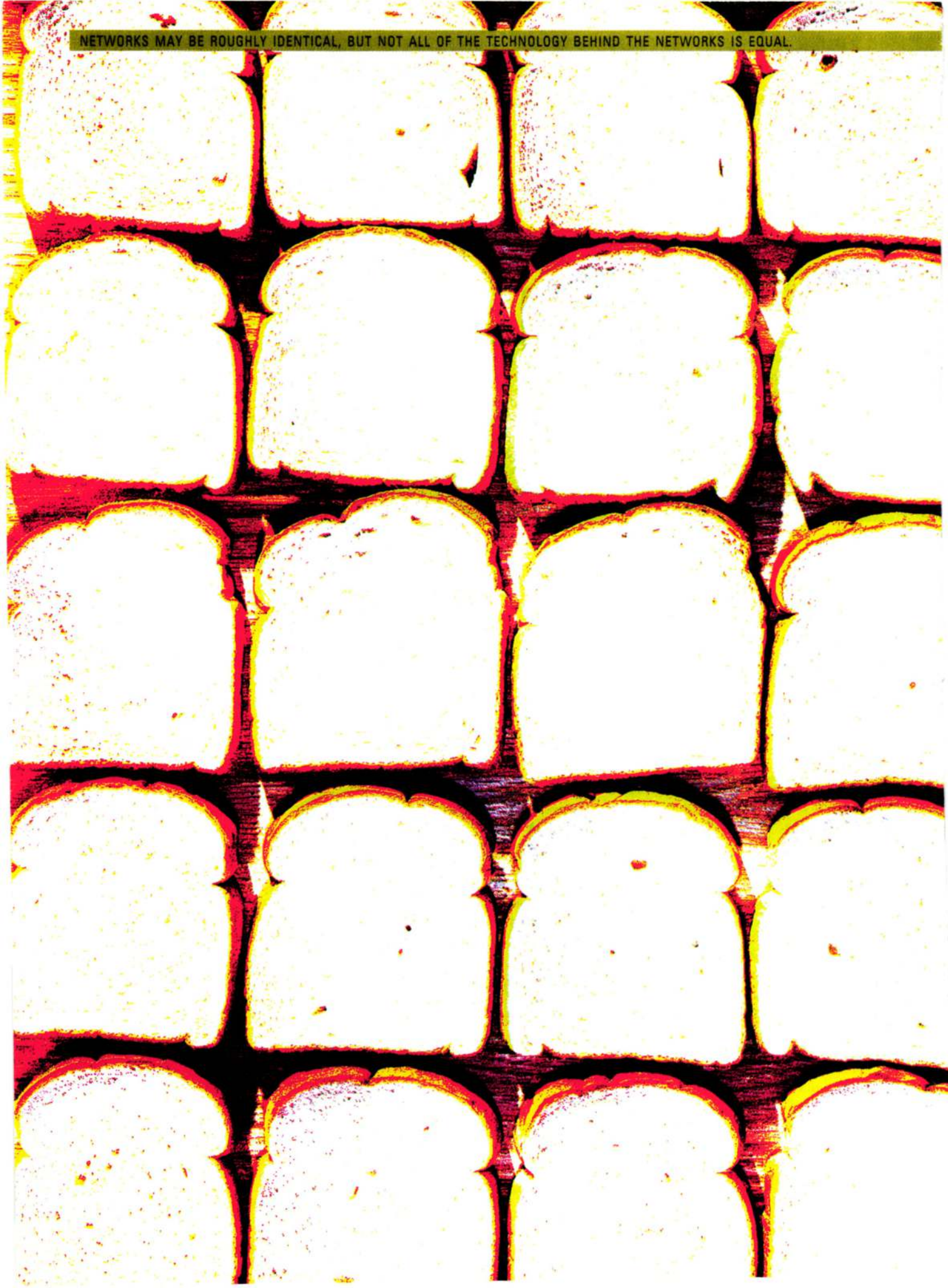
Lycos
www.lycos.com

POPcast Communications
www.popcast.com
www.popster.com

SpotLife, Inc.
www.spotlife.com

VideoShare, Inc.
www.videoshare.com

NETWORKS MAY BE ROUGHLY IDENTICAL, BUT NOT ALL OF THE TECHNOLOGY BEHIND THE NETWORKS IS EQUAL.



THE BROADBLAND ASSORTMENT

THE RUSH IS ON TO BUILD THE BROADBAND NETWORKS THAT WILL MAKE STREAMING WIDELY AVAILABLE, BUT THE MARKETING HYPE AND SHEER NUMBER OF PLAYERS IN THE GAME MAKES IT DIFFICULT TO DISTINGUISH WHO'S OFFERING WHAT.

WITH DOZENS OF COMPANIES, FROM LARGE, well-known firms like AT&T and Intel to smaller specialty houses like Globix and GeoVideo, claiming to have fiber networks with the latest, greatest technology to serve streaming media users, how is a content owner to sort through it all?

"It would take a million engineers and a long debate to determine whose is best, but at the end of the day, the networks are all pretty much the same," says Jim Friedland, senior telecom services analyst at investment bank Robertson Stephens in San Francisco. He adds, although the fiber may be indistinguishable and sold as a commodity, the network service providers can still distinguish themselves by their marketing, management, and financial traits.

One thing that tends to confuse the situation is that the word *network* means different things to different companies. For a facilities-based carrier, a fiber network involves bulldozers and the installation of fiber in the ground, under the sea, or along the right-of-way for other utilities to build a fiber plant. Other carriers and service providers put together private label networks by purchasing chunks of capacity from

these facilities-based carriers. Also, if an upstart network services company can't afford a 10- or 20-year purchase of dedicated fiber, it can buy bandwidth-on-demand fiber services or even obtain fiber at cheap prices via several online fiber exchanges. Some of the new companies claiming to have or be networks, however, aren't using the term to refer to fiber at all, but instead say their network consists of their distributed tiers of equipment, for example, dozens to thousands of servers or data centers.

Companies that have developed fiber networks, referred to as facilities-based carriers, are difficult to compare on an apples-to-apples basis as well. Do they do long haul or local transport of traffic? National or international? Some of the biggest facilities-based carriers are Williams Communications, MCI Worldcom, Sprint, Qwest, AT&T, Teleglobe, and Level 3. On the international side, owning the extremely high-capacity fiber cables for transoceanic transport, or trunking, of massive amounts of telecom traffic are carriers like FLAG and Global Crossing. On a local level, such companies as Metromedia Fiber Networks and other startups are

installing metropolitan networks in rings around cities.

Complicating the networking picture even further are new wireless broadband technologies that use fiberless optics and laser beams for high bandwidth data. Networks based on these optical technologies are sprouting up in places like Seattle, with TeraBeam Networks, and San Diego, with AirFiber. The networks are not ubiquitous, but reach point-to-point and interconnect with other networks to provide a national or global footprint.

It is likely that streaming media will place huge bandwidth demands on fiber networks, thus, among all the competitors and collaborators claiming to have a network that is the best, largest, and most state-of-the-art, the one most closely suited to meet streaming media's special demands will be the most useful. Despite Friedman's statement that the networks are all roughly the same, not all the technology in the various networks is equal.

The newest networks are built exclusively around optical fiber. In the United States, neighborhood networks may still be old wires, but the backbone of the big networks that carry aggregated traffic use high-capacity fiber, which has replaced older legacy networks based on copper left over from the days of highly regulated telecommunications. Dense Wave Division Multiplexing (DWDM) revolutionized the fiber world a few years ago by greatly expanding the capability of a fiber-optic strand to carry more data, thereby exponentially dropping the cost of bandwidth. DWDM assigns signals to different colors or wavelengths so that each optical strand can carry more data packets. Upgrades can be made by installing new equipment, such as core switches and routers, rather than laying all new fiber. Lucent and Corning, the top two fiber makers, are continually improving their products, along with a large number of smaller startup optical equipment suppliers.

The speed, or data rate, of traffic carried over fiber is referred to as OC-3, OC-48, and so on. An OC-3 connection has a 155Mbps data rate and is roughly 100 times as fast as a T-1 line used for business connectivity. Metropolitan networks tend to run at OC-3 or OC-12 rates, and higher rates like

OC-48 (2.5Gbps) and OC-192 (10Gbps) are used for longer distance transport of traffic. A company getting into the network services business can contractually acquire fiber capable of these bandwidth transmission rates. Fiber capacity can be sold for the life of the fiber plant under a mechanism called an Indefeasible Right of Usage (IRU), or leased or sold for shorter periods. Fiber is either lit or dark, depending on whether it is live and carrying traffic or dormant.

While AT&T operates much of the older legacy network, it also has invested in a 16,500-mile, state-of-the-art national fiber network and uses the advanced network to compete with

"All fiber networks are not created equal," says Greg Onyszchuk, vice president of emerging markets for Williams' media services unit, Vvix.



Globix's new encoding studio is state of the art.

companies like Williams Communications and Qwest, which have new optical networks. The AT&T fiber network will be complete by the end of 2001, according to Bill Hoffman, spokesman for the company. AT&T has several uses related to streaming media for its network. Big media companies, like Tribune Media, are using AT&T's streaming media network that runs on the network's OC-48 fiber to transport video files. An OC-192 fiber link runs coast to coast for Internet Protocol backbone services that are part of AT&T's public data network. In addition, Hoffman said that AT&T serves the private label service provider marketplace by building overlay networks for others, but he could not disclose the names of those customers. AT&T also has an initiative called the ecosystem for media, in which four digital media centers are used for

streaming and other services.

Williams Communications, located in Tulsa, completed its 33,000 miles of fiber network late last year, connecting 125 U.S. cities by using an optical architecture designed to maximize the amount of traffic on each fiber and ensure high-quality delivery. The Williams network is the second or third largest U.S. fiber network, behind Worldcom and AT&T, depending on whether total fiber miles or gigabit miles, factoring in how much traffic can be carried, are used in the compression.

In mid-2000, Vvix, which has served broadcast TV clients with transport services for more than 12 years, launched a streaming infrastructure project called Media Xtranet, offering services over its network to streaming media and webcasting users. Greg Onyszchuk, vice president of emerging markets for Williams' media services

subsidiary, Vyvx, says that all fiber networks are not created equal. The entire Williams' fiber network is lit at OC-192 speeds, while some competing networks are limited, at least in parts, to lower rates because the fiber is older and can't be upgraded with the equipment that allows the lightwaves to carry more traffic.

Repeaters and switches are also part of a fiber-optic network. According to Onyszchuk, to differentiate its network from a quality of service standpoint, Williams used more conservative spacing between repeaters, needed at multiple points in a fiber strand to repeat and boost the signal, than other network builders. Williams spaced its repeaters 40 miles apart, compared to

Center at Williams' Tulsa headquarters opened this past fall along with three Media Edge sites, one each in Los Angeles, New York and Chicago, from where the rich-media content will be cached and streamed. Onyszchuk said no customers had been announced yet, although several were in demonstrations. Vyvx's service offerings will include content collection, hosting and management, and distribution, all of which will use assets Vyvx has in place for its fiber and broadcast service businesses. The objective will be to deliver streaming media content belonging to Vyvx's traditional broadcast customers, new webcasters, or other businesses to broadband service providers who can then redistribute the streams to their customers.

MCI WorldCom, located in Washington D.C., has a 48,000-mile U.S. high-capacity fiber network. Through its UUNET subsidiary and other business divisions, WorldCom serves millions of customers with a wide range of services on the network. In December, WorldCom announced that it would add audio streaming over the Internet to the services it offers. Level 3, based in Broomfield, CO, another facilities-based carrier, owns metropolitan, long haul, and undersea networks that connect on local, national, and international levels.

Level 3 is building an IP network with 16,000 miles of U.S. intercity links and 4,700 miles of European undersea network connectivity. The network will connect 56 U.S. and 21 non-U.S. cities. A new facilities-based carrier, Velocita, is building a 10,800-mile fiber and conduit network that will connect 50 major metropolitan areas in the United States when it is completed later this year. Velocita, which changed its name from PF.Net in January, will install the latest IP-based network architecture when the fiber is complete. Velocita is partnered with AT&T on the project.

While focused mainly on installing local broadband networks, Metromedia Fiber Networks claims to have 1.2 million fiber miles worldwide in its optical network. Metromedia's goal is to extend fiber onto metropolitan streets and into buildings to reach end users in top-tier markets. In the United States, Metromedia has networks under construction in 17 cities and plans to build in 51. Carriers like BellSouth, SBC, and Verizon also are building out optical fiber in the loop in their regional and local networks.

For special applications like streaming media, just having access to a fiber connection probably is not enough. Streaming content generators tend to want services and help with

When John Chambers, the CEO of Cisco Systems, a leading provider of networking products and software, gave his keynote address at the Consumer Electronics Show in Las Vegas, he wanted to share his company's goals with the world. To make Chambers' dream a reality, the Globix Streaming Media Group traveled to Nevada and provided the on-site production and encoding, which enabled it to be broadcast over the Internet.

the 60- or 80-mile spacing used by some networks. This is meaningful in two ways, Onyszchuk said. First, the closer repeaters mean that Williams will not live at the edge of its optical loss budget, that is, it repeats the signal before it starts weaken at the edge of the distance it can travel before fading out. Second, when new equipment is added, the closer spacing will help to allow the lightwaves to be even further subdivided and even more traffic to be carried on a single fiber strand as a result, thereby driving costs down further, at least in theory.

Vyvx Media Xtranet service is currently moving forward. The Media



When Bill Gates showcased the launch of Windows 2000, he turned to Globix to stream his message to thousands of viewers over the Internet. Globix received the signal via satellite downlink, encoded the audio and video in Windows Media format for both narrowband and broadband users, and hosted the streams in its multiple Internet Data Centers for the live presentation. No bugs, no hitches. Just a smooth webcast.

preparing and delivering their digital streams to their destination, whether it is on the public Internet or another destination. A long list of specialists has jumped into the business of doing just this, and they have fiber networks or good access to fiber. Among them are the utility and telecom company Enron; content distribution network service providers, such as Mirror Image, Digital Island, and Akamai; and the computer component supplier Intel. The fiber transport is typically packaged with production, encoding, content distribution, and other services.

Enron offers Media Cast streaming services on its Intelligent Network, described as a "broadband overlay to the public Internet." The network includes 18,000 miles of routed fiber in the United States. Internet router manufacturer Cisco Systems and DWDM-supplier Ciena are Enron's partners. Media Cast allows streamed video to be shown on larger screen windows on a computer screen with stereophonic sound and error-free imaging, delivered at speeds up to 50 times faster over the Internet. Enron, however, is more interested in the service element of the business than in expanding its fiber system, according to Shelly Mansfield, Enron spokeswoman, who says the goal is to promote the connection between networks at the local level to enable better content delivery.

Internet content distribution network services company Mirror Image also offers streaming over its network, which consists of 24 large, computer facilities, called Content Access Points (CAPs), where data is stored, cached, streamed, searched, verified, and otherwise manipulated. Mirror's streaming service, Instastream, was launched in October 2000 on the network, and by January the company had 10 Instastream customers. Mirror Image uses fiber to link its CAPs into other large networks with which it has peering agreements. The CAPs are filled with sophisticated networking gear, for example, Cisco router and load-balancing equipment at the headend, connected to a backend of streaming servers delivering Real, WindowsMedia, and QuickTime streams. The servers are connected by fiber to a storage area network. Each CAP can serve a minimum of 12,000

concurrent Real or QuickTime streams and 8,000 WindowsMedia streams.

"The fiber role is in cross connects, with a minimal OC-3 rate, from CAP to the Network Access Point," says Tim Desai, Instastream senior manager. "The cross connects are at the crux of Mirror Image's success today and in the future. The more cross connects with ISPs and enterprises, the more directly you can serve to them. Streaming performance is all about cutting router hops out of the picture."

Fiber is only going to become more important as streaming takes off. "If the Internet market grows the way we're predicting it will, we will need multiple gigabits per second out of each CAP. Optical fiber is the way it will happen," Desai says.

Akamai, another Content Distribution Network (CDN) service provider, uses a totally different approach than Mirror's centralized, high-capacity data center model. Akamai has about 8,000 servers distributed globally into the networks of others, including ISPs and enterprises.

Globix, another CDN, also runs a Streaming Media Network, which it claims is the world's largest based on the number of its peering agreements (more than 1,100) for network exchanges that move its customers' content close to the edge. Michael Moskowitz, general manager of the Streaming Media Group, says the high degree of peering allows Globix to control the data path through the network and manage its quality of service. Globix uses two fiber backbones, an OC-3 network built by Qwest and an OC-48 connection supplied by Global Crossing.

Moskowitz says at least 15% of Globix's 2,200 customers are streaming users. Globix packages the fiber transport services with support services for streaming media users, ranging from live acquisition from a satellite or private network to providing cameras, a production crew, post production, and encoding work. Globix runs the full service shop itself, rather than relying on partners and outside relationships, which Moskowitz says, gives it more control and an advantage over its competitors.

Intel also has a scalable and intelligent network for streaming

media, operated by its Internet Media Services (IMS) division. The network uses dedicated fiber links to connect its broadcast centers in Oregon and London to a server network in the United States and Europe. Intel streams data from one of the broadcast centers to the Internet via the network of servers that it owns or controls in 22 places in the United States and Europe. Its customer list includes SPACE.com, Quokka Sports, and Terra Networks.

McGregor Agan, director of marketing for Intel's Internet Media Services, says use of dedicated fiber "takes the vagaries of the Internet out of the equation. It provides clean lanes for our streams to the POPs, which is most important for live streaming." The network's intelligent software, used to map Internet congestion and find ways for packets to navigate around it, was designed by Intel engineers and is not sold to outsiders, but is available to partners of Intel IMS, for example, financial and business webcaster MediaOnDemand.

Streaming media content owners, comparing the networks, should look at a service provider's intelligent network software for a start. Other points of comparison, Agan suggests, are the level of resiliency built into the network-operating center, i.e., how it will hold up during an earthquake, a power outage, or a backhoe cut of a Sonet fiber ring, and how well-tailored network add-ons are for specialized customer niches. The Intel broadcast centers have backups for power and redundant connections to public networks to add resiliency. Intel's service has features like an online content management system that allows the content owner to access Intel's network to post content or obtain reports on activities involving their content. This is an additional value.

Streaming media places special demands on the networks that include the need for reliability, scalability, and support for the business motivation behind the content, and the degree to which a service provider answers those calls will determine its success. "It's important that we are an enabler in the path to real return on investment for the entertainment and enterprise side. Vendors that support that objective will

(Continued on page 59)

(Continued from page 50)

win. Customers will judge the networks on that point," Agan says.

GeoVideo Networks is another specialized provider of streaming media network services, launched in March 2000, to provide a broadband video network capable of sending HDTV-quality video over fiber for use over the Internet or to other destinations involving the business television market. The first piece of fiber in GeoVideo's network was a connection between Los Angeles and New York, supplied by Metromedia Fiber Network. The financial backing of equipment maker Lucent Technologies and its relationship boosts GeoVideo with 27 public TV stations grouped together in CSRF Digital LLC. Another relationship will allow GeoVideo to obtain technology from Bell Labs.

Bryce Combs, GeoVideo's COO, says the way a fiber network is lit, managed, and laid out is critical to its ability to deliver real-time, fast video. GeoVideo's network plan will allow a user to send a video stream over a network protocol called Asynchronous Transfer Mode (ATM) or use the Internet Protocol (IP) standard that has become ubiquitous with the growth of the Internet, or both. ATM allows a higher quality of video transport than IP networks, but not all customers require the higher quality, so GeoVideo is planning to be able to deliver either service level, alternatively or at the same time. For example, a user might want one video stream of broadcast quality to run on TV screens with another stream for desktop viewing.

"For desktop applications, videoconferencing, or collaboration, it's fine to be in a pure IP environment, but for the corporate world, if you are a major TV network, moving a TV movie of the week across the country for distribution or for viewing by movie critics, you will need an ATM network to move at an extremely high quality with a guaranteed security level. In the corporate world, a CEO addressing employees would want to collaborate, where he could take questions and also be on a large screen in a theater," Bryce says.

Advanced fiber can have ATM switches or IP routers, allowing either transport protocol to be used. The two

technologies have performance differences, but "as the IP protocol has matured, manufacturers have devised schemes for IP signals to be delivered with better quality," says Onyszchuk of Vyvx. ATM cannot be run over an IP network, but fiber engineering has advanced so much in the last few years that ways have been developed to encapsulate one standard in the other or translate between the two. ATM is more bandwidth intensive, and so the more the streams can rely on IP, the lower the cost of the transport portion of networking.

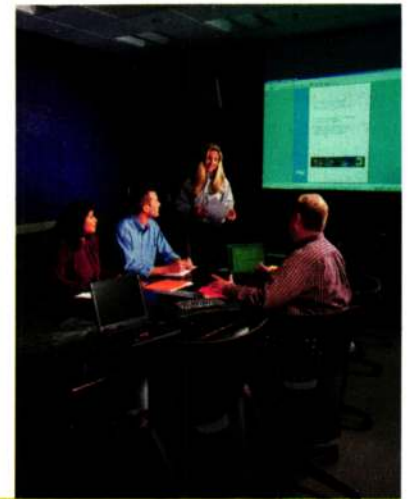
So, which network approach or offering is really the best? That question is difficult to answer, experts say. Randall Haley, a network analyst at Strategis Group, based in Washington D.C. says, "It's tough to compare. On their websites, they all sound like they are superior to their competitors. There's not an easy metric to rank optical networks."

"Streaming media hasn't been mature long enough to produce quality level metrics," says Agan. "The benchmark at the end of the day is the best quality stream that brings value to the customer."

Meanwhile, streaming media

content owners face tremendous challenges in sorting out their business models. While they do so, those who own the fiber that will transport their digital treasures will prepare and wait. As Onyszchuk says, "We are a very longterm play. With the rise and fall of some of the more recent companies, it creates an opportunity for us. ... We are extremely bullish on broadband media. It is the next content wave for the Internet." □

Theresa Foley lives in Key West, FL, and specializes in technology journalism, including telecom, satellite, broadband, streaming media and wireless.



Intel's conference center, (top) located in the broadcast operations center, is for consumer visits and planning strategies. The broadcast operations center (above) is where Intel technicians monitor the network intelligence technology for quality assurance.

BUILT FOR SPEED

MEDIA DVX ENTERS THE FIELD OF DIGITAL VIDEO DELIVERY.

MARSHALL MCLUHAN, MEDIA GURU OF THE 1960S,

observed that a difference between the physical world of the industrial revolution and the emerging electronic world is that there is no "geography" in the electronic world. "All points on an electronic network are equally distanced from all other points, and travel point-to-point is instantaneous." This sentiment was true for getting a commercial from the people who created it to the broadcast entity that played it. In order to transfer the commercial, they had to dub the spot to tape, put it in a box, and then ship it by bicycle, truck, or plane. Geography counted, and it equaled time.

Fortunately, Media DVX chairman Robert Rudelius and president Ron England questioned this practice of transferring tape. After a stint at AT&T, they moved on to Control Data Corporation, and while there they saw the future of digital files. "We saw that 65% of the market was available," says England. "The independent post houses and dub-and-ship facilities were being pressured for better delivery."

Forward-looking stations and networks were beginning to use digital file technology, such as MPEG2, instead of videotape as a quicker, more flexible, more convenient, and less expensive way to go to broadcast. "We say, if we can deliver in digital throughout, there's no need for videotape," says England. "It's faster, easier, cheaper, and involves fewer people."

Control Data, now Syntegra, recently became a part of British Telecom. "They didn't want to take the early losses from development," England says. "So, we bought the

intellectual property from Control Data before its sale to Syntegra." Media DVX (www.mediadvx.com), the company that offers digital electronic delivery of commercials and is located in Arden Hills, MN and New York, took the early losses that were appropriate for a startup company and hired Control Data/Syntegra for the engineering.

How It Works

A Grass Valley Group Profile Professional Disk Recorder (PDR 300) encodes content from a video source, such as an edited master tape, usually digital video or NTSC analog, turns the video into a 4:2:2 MPEG2 file, and stores it on its hard drive. During the process, each commercial is assigned an International Standard Commercial Identification (ISCI) code, the unique four-letter and four-number code used to identify that specific spot, which is used to track, move, and schedule the commercial.

After this process, the advertiser enters an order that will send this commercial, identified by the ISCI code, to the stations. "When they hit *submit*, that's the last manual step," says Robert Krizik, vice president of sales and marketing for Media DVX. The commercial moves to the outbound queue on a server at the post house or dub-and-ship facility. From there, it is uplinked to a PanAmSat satellite and downlinked to PanAmSat's teleport in Georgia. It is then placed on a server to be sent by IP multicast back up to a PanAmSat satellite and then beamed down to the receiving TV station or cable company, where it resides on the server until it is broadcast.

The spot's progress can be tracked

by computer over the Internet. "People in production don't need to know anything but the ISCI code," says Krizik. "If the screen reads *in process*, the spot is on its way from the originator to the receiving station. When the screen says *completed*, you know exactly where the file is; it's stored in the station's server. Then they can move it wherever they want. It can go to other digital storage or onto tape as an NTSC or digital dub."

Media DVX supplies the system and equipment to its clients, post houses and dub-and-ship facilities that encode



and move the commercials to customers, the end users of the spots.

Easy Handling

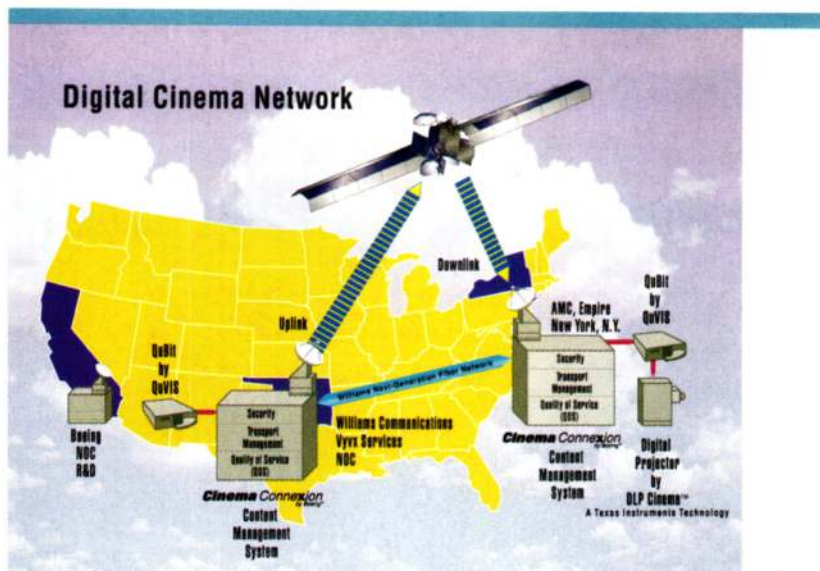
Making a batch of dubs; handling the tape, boxes, and labels; and shipping by courier is a lengthy process. Once received, the spot has to be logged in, placed in a library, possibly transferred to cartridge, and physically handled each time it's scheduled to play. Compared to Pelco's process, the old way seems unbearably slow. "The job (a spot for *Today's Man*) was entered at 4:38 p.m. At 4:46, we're done encoding

it," says Karl Keleman describing Pelco's efficient process. "On our end, we've put down 6:00 p.m. to finish the dubs and the handling for commercials not going to Media DVX stations. If it were all electronic, it's out at 4:46." At television and cable stations, handling digital files is much easier than dealing with physical tape.

The ease of handling digital files is also helping create new broadcasters on the Internet. JAGfn.com., the Internet-based financial news service, broadcasts thirty minutes before the stock market opens until half an hour after it closes.

The live Internet broadcast, differing little from regular broadcasts, is completely supported by commercials and advertising. A recent startup, JAGfn.com was able to design its broadcast operations to take advantage of the latest digital technology. For commercial handling, they decided to use Media DVX's Grass Valley Profile and digital files.

The majority of the commercials aired come through the Media DVX system. As they come in, they show up as a list of files, like an email list. Moving them from the profile to the



Vyvx's digital cinema network has been described as "the future in theatrical film delivery."

default drive and building a playlist are done with a few clicks on a computer screen. "With Media DVX, we check the label to be sure the spot is right, and that's it," says Bill Herlihy, vice president of production operations for JAGfn.com. "No librarian, no coordinator; one guy does it all, assembling the day's commercial playlist on a computer, putting together 120 spots with bumps and other material in about 25 minutes. We're trying to make as much use out of our people as we can. We double up jobs." This process allows the advertiser load to grow, creating significant savings in labor cost.

The New Kid on the Block

Since its beginning in September 2000, Media DVX has reached an estimated 140 stations and has commitments with another 30. Its customer list includes stations in every major market and broadcast group, including McGraw Hill, Paramount, Tribune, A.H. Belo, and Meredith. It also works with major network affiliates around the country. A major problem for Media DVX is that its field is dominated by two major players, DG Systems and Vyvx, which have been in business longer and have signed up to four or five times as many stations.

DG Systems

"The most commonly accepted video format in TV stations today is electronic delivery from DG Systems,"

says Bob Howard, vice president of sales and marketing for San Francisco-based DG Systems (www.dgsystems.com), which services an estimated 775 stations.

Digital electronics are more than a way to get spots to stations fast. "Our goal is to handle video better, faster, and cheaper by doing away with tape, trucks, and paper and handling all aspects of commercial management digitally." When a spot is created, it needs approval at various locations, and digital electronics will always trump geography. Once approved, the spot must be distributed for broadcast, and then it can be catalogued and archived digitally. Tracking and managing the spot from initial order through delivery verification and play reports can all be handled electronically.

"The better and faster parts are easy to identify," Howard says. "Delivering a finished spot to a client in hours, not days; that's better and faster. Letting the sales force view the new spots over the Web at home, rather than mailing VHS tapes; that's better and faster. Making a last minute change and digitally sending a new spot to stations within four hours; that's better and faster."

The simple part of the task is to identify out-of-pocket costs, such as airfare, dubbing, and overnight freight charges. The more complex part of the task is to identify and place value on the costs of managing the steps in the process. "Currently, these are mostly ad hoc and use few standard practices,"

Howard says. "For instance, what is the cost for a coordinator to track down someone who is traveling, yet needs to view a spot immediately? Or, what is the value of faster transfer of creative iterations across continents? The benefits are clearly there, even if they are hard to quantify."

In addition to moving spots digitally, DG Systems also offers its clients various editorial services, such as closed captioning, tagging, audio overlays, reslating, and CD ROM burning.

Vyvx

Vyvx, part of the Williams Communications Group (www.williamscommunications.com), of Tulsa, is closing in on DG Systems, with more than 600 stations. "We moved 2.75 million spots last year," says Greg Onyszchuk, vice president of emerging markets for Williams Communications Broadband Media Services. "Our core ad distribution service has three different delivery models. We have the traditional physical tape in a dub-and-ship mode. We offer a digital delivery system based on IP multicasting, where we pitch files in the evening to over 600 stations equipped with servers. We have the older way of electronic delivery, sending the spot to a digital receiver serving a tape machine, which outputs the spot on tape." Other Vyvx customer services include a service to gather finished ad spots and plug them into the delivery system, a shuttle-like service for customers to get spots back and forth for approval, and other areas such as tagging.

Are Two Advantages Enough?

Media DVX, although younger and smaller than the established players, offers two advantages to the post houses and the dub-and-ship facilities that use their services.

First, the quality of their services is outstanding. "Their biggest asset is the quality," says Bill Matz of Syncro Services in New York. "The Media DVX product is much better than anyone else's. For the others we looked at, the bit rate on encoding commercials into a digital file was on the 3/4 inch tape level. We wanted at least Beta SP level. When the bit rate is

too small, you can lose the small print on the commercial. Then you go to tape and lose even more. The titles become too soft. Media DVX encodes at 16Mbps using the Grass Valley encoder. That's much better quality."

The second advantage is that Media DVX is simply a pipeline for delivery. Unlike DG Systems and Vyvx, it does not compete with its clients, the post houses and dub-and-ship facilities. Vyvx's Onyszczuk says, "We have a dubbing facility in Memphis about two miles down the road from the FedEx hub. We can dub into all of the tape formats the recipients want." As a result, some independent operators fear that DG Systems and Vyvx are intentionally competing with them for their customers.

Media DVX considers Federal Express and UPS as its main competitors. Similar to those companies, Media DVX offers a guarantee. "Should the station not be able to receive the spot electronically," says Howard, "we have a backup facility in Louisville, Kentucky, where we can create a tape dub and ship it to the station by express."

Impending Nuptials?

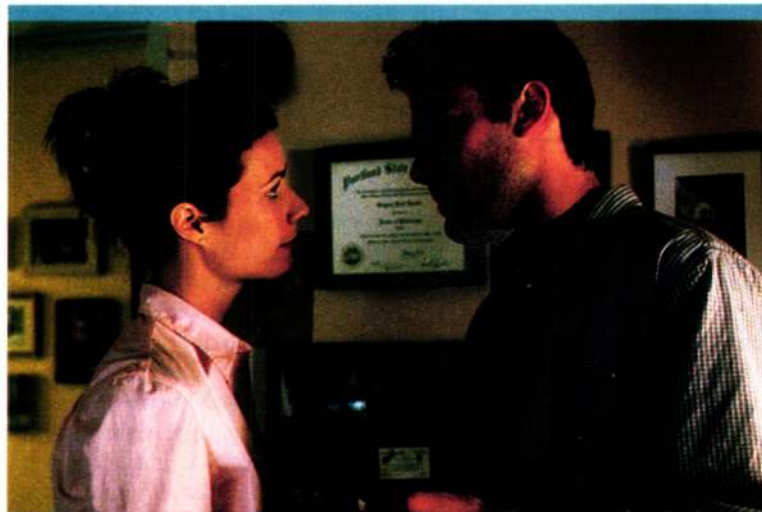
At least two independents stated that they hoped to put Media DVX together with another small company, Sea Change International (www.schange.com) of Maynard, MA. Founded in 1983, Sea Change has had a lot of experience in building video servers for other companies. Most of its revenue comes from the global sale of capital equipment, turnkey video service systems.

The company's Las Vegas-based MediaExpress service provides digital distribution of advertising spots to TV stations and cable headends. Infomercials and spots of various lengths are digitally encoded in MPEG2 format at 18 Mbps in 4:2:2 broadcast format, transmitted to a satellite uplink, and beamed to television stations, where they are received and stored in digital video servers.

"We're in about 40 TV stations," says Vic Lai, president of MediaExpress. "We're the turtle in the race. We also have access to all the cable headends where we have ad



Ben Affleck and Gwyneth Paltrow starred in Miramax's *Bounce*. Vyvx provided digital delivery of the feature with the film encoded from a telecine in Los Angeles and projected in a theater in New York City. (Photo courtesy of Eric Lee.)



As part of a test, *Bounce* was shown in split screen with projected film. Part of the time, the film was a brand new print, and part of the time it was a print that was three or four weeks into the run with the usual dirt and scratches, which could be compared to the digital video that never changed. (Photo courtesy of Miramax Films)

insertion equipment. We think the advertising market is moving towards targeting consumers. We offer advertisers the capability, on a cable headend basis, to reach the demographics they are targeting. For example, GM sells trucks, cars, and SUVs. Currently, they are advertising these on a national basis, but they know demographically that in any city, the buyers for a specific vehicle are more geographically situated. Take the Bay Area as an example, where you have San Francisco proper, Marin County, the East Bay, and the South Bay, each with different demographics and consumer profiles. We can offer the capability for GM to send four different ads to the

Bay area and have those ads air based on geographic designations. So, in the same commercial break, within any time period or any program, we can insert four different ads for four different vehicles."

The high quality of both Sea Change and Media DVX products are a natural fit for the marriage brokers. The brokers would also like to match Sea Change's penetration of the cable market to Media DVX's growing list of broadcast stations. Neither company, so far, will even admit they are holding hands.

"We have talked off and on for about two years," says England of Media DVX. "We understand what they are doing. They understand what

we're doing. But we haven't been able to go beyond that."

Station Reluctance

Like their competitors, Media DVX installs the system—computer, monitor, keyboard, storage, software, and 1.2 meter satellite dish—at their own expense. "The only thing the station has to do is supply the outbound Internet connection," says England. Unfortunately, not all stations have adopted a digital delivery system. There are some stations where it is not cost-effective to put in a full digital server. Pelco's Keleman disagrees, "If a major advertiser would say, 'We're going to send all our commercials by Media DVX,' everyone would put that box in."

Media DVX makes the entire process by using the experts, or core partners, on the front lines to handle the details. In other words, DVX Stream never competes for customers with the people who offer its services. The core partner encodes the video as a streaming media file for playback in one of the standard Internet formats—Microsoft Media, RealPlayer, or QuickTime—at the speed the website owner requests. The file is stored on a server with Internet access, and the core partner emails the end user a URL that can be posted on the website. Visitors to the website are blissfully unaware of this process.

The Future

Currently, these companies move

dropping," says Vyvx's Onyszchuk. "The first was that you have to encode the movie in a file of a reasonable size. The technology now exists to take the raw telecine output of about 1.5TB and reduce it to 50GB. Barrier two had been to have a digital projection system that would pass muster with film people as to quality. The Texas Instruments Digital Light Projection (DLP) system seems to be good enough. The third barrier has been the notion of security. Hollywood is not eager to put a film on a network where it can be stolen. New algorithms for encryption exist to provide the security, to lock down digital files before they are transmitted and while transmitted."

The film was delivered simultaneously over the Williams fiber-optic network, uplinked and beamed over satellite, and then downlinked to a receiver dish on the building. Both versions were recorded on the server at the theater. As part of a test, *Bounce* was shown in split screen with projected film. Part of the time, the film was a brand new print, and part of the time it was a print that was three or four weeks into the run with the usual dirt and scratches, which could be compared to the digital video that never changed.

Certainly, today's HDTV provides an image that would be acceptable on the screen of most movie theaters, and resolution and hard drive storage always improve as technology evolves. It's not a very big leap, therefore, to a time when digital delivery could do for theaters all over the country what it now does for TV stations.

Media DVX's Rudelius envisions marrying commercials to feature films. Today, we have boring slides advertising to the people who get seated before the lights go out. Tomorrow, these could be well-produced commercials, delivered by satellite and integrated into the film presentation package. People might even like it. "In Europe, theaters publish two starting times," he says. "One for the start of the commercials and the other for the start of the film." □

"If you go out to websites, very few actually have streaming video..."

Melvyn Potash, vice president of sales for New York-based AGT Broadcast Services moves commercials by tape and through the DG Systems distribution network. Potash cites the job security of the tape handlers as a reason for the resistance to an all-digital format.

Most stations eventually will have a digital server installed. The question for Media DVX and the others is whether the stations are willing to have three, four, or more servers, or if the economics of an industry that has yet to show a profit will kill off all but one of the digital distributors, leading to standardization through survival.

DVX Stream

Once in the digital world industry, Media DVX saw another opportunity and launched a second business, DVX Stream. "Originally, we were thinking very narrowly about moving TV content to the Internet," says CEO Rudelius. "If you go out to websites, very few actually have streaming video, even though it's being talked about and the technology is available. The reason is simple. Most website owners are not in that business. They may not have any video produced, and they don't know how to encode and store it for playback."

30-second commercials from a hard drive located at a post house to the hard drive of a similar computer at a TV station. In the future, the same system, along with streaming media, could be used to provide video content of all sorts to anyone with Internet access. Video-on-Demand has arrived for pay-per-view movies. Next, imagine being able to watch a favorite TV show, such as *The West Wing*, on Thursday at 6:23 p.m., instead of Wednesday at 9:00 p.m. "Or suppose you could get *West Wing* whenever you wanted it, commercial-free, for a dollar," adds Ron England. "Would you pay it? A lot of people would."

Rudelius of Media DVX sees a future for the system in theatrical film delivery. Huge cases containing reels of film have to be physically moved about the country from theater to theater in order to show movies. The parallel to commercials being distributed on videotape is obvious; only the size of the package and the size of the screen are different.

On November 14, 2000, Vyvx provided digital delivery of the feature film *Bounce*, with the film digitally encoded from a telecine in Los Angeles and projected in a theater in New York City. "The barriers to digital cinema are

Contributing writer Barry Hampe and his partner Sylvie Hampe own The Writing & Editing Company in Lake Ridge, Virginia, where they produce videos and write scripts, articles, and books.

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ON THE SIDELINE

THROUGH INTERACTIVE STREAMING, SUPERBOWL.COM TV OFFERED CONTENT THAT MAKES FOOTBALL FANS FEEL AS THOUGH THEY'RE PART OF THE TEAM.

WITH THE WEB AND STREAMING TECHNOLOGY SHOW-casing sports content more and more each passing month, it seemed only natural that this year's Super Bowl would take a technological leap and offer broadband content on the Web that would not be available anywhere else. SuperBowl.com TV was created by NFLFILMSTV and interactive streaming media company SeeItFirst with the goal of offering fans a front-row seat to the buildup of football's game of the year. For four straight nights preceding Super Bowl Sunday, Rebecca Grant of FOX's *NFL Under the Helmet* hosted a 30-minute webcast that offered unique interactive interviews and real-time polls. The shows were available at three different rates – 56-, 100-, and 300Kbps – and were viewable with the Windows Media Player. Plenty of work went into producing these online events, and we'll look at how it

all came together, from the technology behind the show to the masters of filmmaking who made it all happen, NFLFILMSTV.

SeeItFirst, a privately held media company based in Fremont, CA, provides such streaming products as SeeItFirst Live!, an interactive webcast platform, and SeeItFirstNow!, their Video-on-Demand system. The goal of the company is to take the often passive webcasting model and kick it up into a personal interactive experience. The software and services they provide can be licensed and applied to any number of online events. Positioning itself as a middleware player, SeeItFirst provides the tools to move the clients content out to the Web. Digital Planet and Intel Internet Media have both used the company's technology, and one of SeeItFirst's biggest productions was last year's Latin Grammy Awards webcast.

Scott Gordon, vice president of marketing for SeeItFirst, saw the partnership with the NFL as especially interesting. "We had been promoting our streaming products and services in various markets since mid-last year," Gordon says, "and specifically to sports entertainment organizations that have or want an online presence. We eventually met with the NFL and were pleased to make progress with NFLFILMSTV shortly after announcing our interactive webcast platform last December."

Gordon worked with NFLFILMSTV to set up an online event that captured the spirit and excitement of football while keeping hardcore fans happy and coming back for more. "Our company provided the platform to enable NFLFILMSTV to create and dynamically push interactive content out during their live webcast,"



he says. "They predefined an online layout that served Web graphics, active links, user polls, player bios, email, and the live video. We tied in the technology to make it happen."

Although similar to broadcast television, creating an online program can be a whole different animal, offering advantages that are simply not possible in other media. "Remember, a webcast is a broadcast of a live event with an Internet audience," Gordon says, "We need to captivate and entertain the Web-viewing audience in order to keep the eyeballs and to take advantage of transaction opportunities such as advertising and merchandizing. During a live broadcast, such as a news program, the director can cut to predefined reporters on location or video feeds and graphics. SeeItFirst Live! provides these capabilities for an enriched webcast; however, this is where the similarity ends. During a traditional live broadcast, it is still difficult to provide viewer interactivity without offering an 800 number or a Web address, taking a viewer away from the broadcast. Furthermore, the broadcaster can only receive general Nielsen demographic information after the fact. A webcast producer, using our platform, can dynamically serve both predefined and on-the-spot polls, trivia, bios, chat, links, graphics, different video feeds, games, messages, and other related content during the live event while keeping the eyeballs right on the site. Another advantage is that viewer

registration may be captured prior to and during the event to provide exact demographics."

Moreover, Gordon believes that the interactive elements provide the real reason to do a webcast in the first place. Although broadcast television offers some features, none compares to the offering taking place during SuperBowl.com TV. NFLFILMSTV had the flexibility to offer what interactivity they wanted and get direct feedback from Web viewers. "NFLFILMSTV had full creative control prior to and throughout the entire webcast," Gordon says. "It is the full discretion of our customer to determine the interactive elements they wish to push during the event. NFLFILMSTV asked the viewing audience some questions, such as who fans would pick as player of the year. NFLFILMSTV also showed prerecorded videos of such things as the coaches press interviews. They also had interviews with behind-the-scenes personalities and offered game trivia. Plus, they pushed show guests' background information. The advantage that our interactivity platform provides is threefold. First, it is flexible so as to work with existing systems, personnel, and third-party vendors. Second, it engages the webcast viewer by allowing the webcast producer to push dynamic content, on the fly and in context, to what the viewer is watching. Third, it enables the webcast producer to further build

ON THE WEB

www.superbowl.com

www.nfl.com

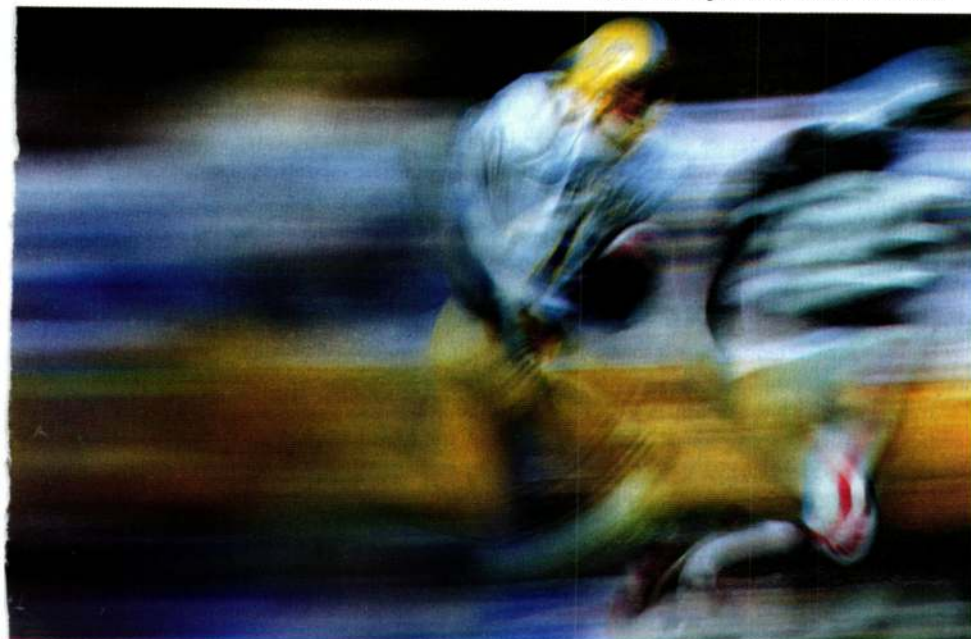
www.nflfilmstv.com

www.seeitfirst.com

up an existing event. For the viewer, it's a cool experience."

How cool? Well, in watching the Superbowl.com TV webcasts, you definitely get the feeling that you are in on the production. When you first log in, you get a video feed shortly before the show that has the production crew going over any last-minute details. As the program begins, host Rebecca Grant comes on and gives a teaser as to what to expect during the 30-minute show. Guests over the four nights included featured players and senior NFL representatives who offered a glimpse into this game's incredible momentum. Excellent package pieces ran during the program, such as profiles of the competing coaches, pre-shot interviews, and highlights of past Super Bowls. Even the Miller Lite commercials were there, albeit trimmed down to mere seconds to keep Web viewers from surfing elsewhere. Anyone viewing could immediately email a question for a chance to have it answered on the air. One of the most fun elements, however, were the polls. For example, there was a vote for best catch of the year. You would see clips of each worthy catch while in a separate window you could not only click to vote, but also access the immediate on-going results and see in real-time who was ahead. Aside from a few technical glitches, like live set microphones being up for a few moments during the commercials, most of the webcast ran smoothly. You got the feeling that you were watching a professionally produced broadcast program.

And professional it was, because Superbowl.com TV was not just another webcast; it was a polished production formed from the solid base of the highly acclaimed NFL Films. NFL Films has totaled 78 Emmys, logged almost 2,000 hours of annual programming, captured more than



100 million feet of NFL action, and has risen to a standard of excellence for almost 40 years based on compelling storytelling and theatrical cinematography. When it comes to sports filmmakers, it doesn't get any better than this. The transition this company has taken to this new medium has been aggressive and strategic. The NFL was the first professional sports

speed Web access kicks into gear, the company wants to be ready with compelling content and interactive elements. Broadband football footage drives a desire for speedy connections, and fast access provides a thirst for TV-quality streaming content. It's a cycle that NFLFILMSTV is not only trying to ride, but also anticipate. The bonus of having the productions shot

related to all the events and activities surrounding the Super Bowl, we could produce a live show several nights leading up to the big game. In addition to the story of the game and the players, we wanted to show the fans some of the exciting events – entertainment, community, charitable, behind-the-scenes, etc. – that take place for the week leading up to the game. It was decided that we could produce the show from inside the NFL Experience, live, for four nights. When

I presented the idea to NFL.COM and CBS Sportsline's SuperBowl.com, they wholeheartedly approved. The SeeItFirst product was demonstrated to us late last

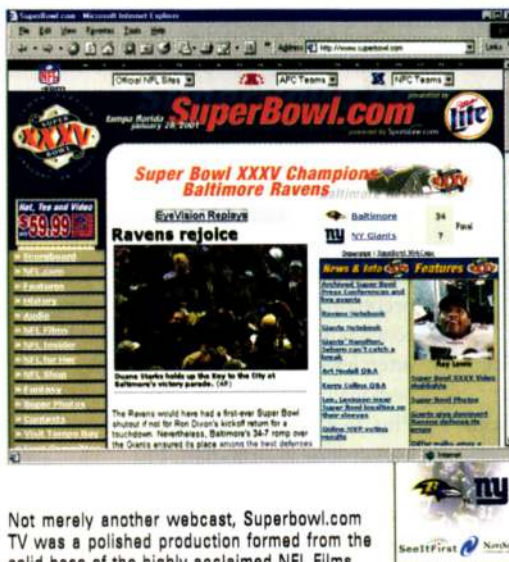
SuperBowl.com TV

league to create its own Internet site in April of 1995. It remains to this day the most-visited sports league website. NFL Films has provided numerous game footage and pre-produced segments that have been streamed over the site for several years. In spring of last year, things got more official as NFLFILMSTV was created to be the broadband channel for NFL.com.

NLFFILMSTV is headed up by CIO of NFL Films Dave Franza, who oversees an Internet production staff of 20 producers, technicians, designers, and artists who create compelling content and streaming events. "We started with our test-case webcast pilot program last July," Franza says. "It was in Canton, Ohio during Pro Football's Greatest Reunion that mirrored NFL Film's coverage of a Super Bowl. NFLFILMSTV produced a live webcast of the Hall of Fame Induction Ceremony as well as 300 video clips commemorating the historic event."

It didn't take long for Franza and his team to ramp up from test case to ambitious online content provider. "Beginning in September of 2000," he says, "each and every week, we presented original and expanded features based on NFL Films current series and specials, including *NFL Films Presents*, *NFL Under the Helmet*, and *Distant Replay*, among others. The site showcases the best shots and sounds from around the NFL captured each week by NFL Film's Emmy award-winning cinematographers and sound crews."

The goal with starting NFLFILMSTV has been to be prepared for the day when all NFL fans have broadband access in their home. As further saturation of high-



Not merely another webcast, SuperBowl.com TV was a polished production formed from the solid base of the highly acclaimed NFL Films.

by established film crews is icing on the cake because the quality is several steps above a lot of typical made-for-Web fare. The company sees its key to success in the ability to do compelling storytelling. Mastering this art in NFL Films has paid off, and moving it to the Web has so far met with critical acclaim and Web traffic success. The fans have loved the storytelling framework of the companies productions and can now enjoy it on the Internet anytime day or night. The promise of delivering this content is only the beginning, and the journey to the Super Bowl online event was a trip that everyone was excited about.

Dave Franza remembers how the webcast came about. "It was back in October. I met with the producers and directors involved in programming decisions for NFLFILMSTV to discuss possible Internet programming related to Super Bowl XXXV," Franza says. "It was decided that in addition to producing preproduced segments

year, and we thought it was a good system in terms of bringing the fans into the show from an interactive standpoint and allowing us to insert information around the videostream, thus controlling the page behind the stream. It was a major project, and we certainly had a lot to do – content and format planning, set design and construction, venue preparation, live video/audio shoot and capture, digitizing and transmission to the Web, segment production and digitizing, writing, graphics, music, travel, crewing, and more."

Franza says, "Technically, [webcasting] is a more difficult task due to the limitations of current encoding algorithms and equipment as well as limitations in terms of bandwidth delivery to the end user. Also, the fact that we were producing the webcast from an outdoor venue, several thousand feet from the nearest permanent building, made connection to traditional modes of file transmission,



as well as communication, a definite challenge. NFLFILMSTV uses its own proprietary encoding system, and we wanted to do so for these webcasts. We were able to use satellite transmission of the streams with our encoding equipment installed on site so that the streams were encoded and delivered as if we were in our home studio in Mt. Laurel, New Jersey. The ability to switch and direct the shows, while being able to roll in footage, edited segments, and graphics, all from a remote location within the NFL Experience, producing a live feed of the finished product to a satellite uplink was critical."

Aside from a lot of technical hurdles, there were other problems that cropped up that no one had anticipated. "On Thursday night, the second night of our webcast," Franza says, "the three NFL players we had scheduled for the show were set up as the beginning, middle and ending segments of the show. At 7:00 p.m., show start time, none of the players had arrived, due to very bad traffic situation surrounding the NFL Experience. The webcast was live, and we had a fixed satellite block of 7:00 p.m. to 7:30 p.m. Gerry Reimel and Scott Leatherman were able to rearrange the show format on the fly and roll in pieces for the first 15 minutes of the show, and all three players, coming from different places, arrived at 7:15 p.m., just in time to get into the show. It was a very tense time, but it all worked out thanks to the ingenuity of our crew and the perseverance and commitment of the players in terms of getting to us."

Looking back, Franza was encouraged with the success of the webcast. CBS Sportsline and even the sponsor, Miller Lite, showed great interest and were glad to be involved. He received many phone calls and emails conveying appreciation and giving congratulations over the project. Having the involvement of numerous NFL players was key and provided the fans with exactly what they were looking for – a chance to watch and interact with their idols.

Franza sums up the experience best by never forgetting the reason why the whole production is done in the first place – the fans. "I believe that the ability fans have to interact with the

guests and to see the results of others who are interacting goes hand in hand with the live aspect of any webcast. We felt that, other than doing live programming because we can, we wanted to give fans the feeling of being in Tampa, right in the NFL Experience, witnessing not only what happened during the day via preproduced segments, but what was happening at the moment, and having their views on various topics heard and reported on. Even the live audience inside the NFL Experience enjoyed the show, and their reactions to our guests and the whole aura of live programming only further added to the excitement of a live webcast that was miles ahead of a pretaped production served up on a website. As with the style of NFL Films on TV over the years, our goal is to use NFL Films' talents for storytelling and cinematography,

and behind-the-scenes access, in conveying more than just the final results of the games, but the entire story of the NFL, its players, and the fans. Just as the story surrounding the footage is important to our TV programming, the package within which we deliver the video/audio streams on the Net is vital to the entire user experience on the Web."

With high-tech companies like SeeItFirst manning the technical end, a wide variety of interactive elements surround the events, continued support for broadband access, and cinematic content from NFL Films, it looks like we are right at the beginning of a long and exciting road for the NFL's streaming webcasts. The content, delivery, interaction, and quality will only surpass what is currently available in the years to come. ☐

Contributing editor Frank McMahon is a media artist specializing in directing, editing, animation, and graphic design. His work can be seen at www.fmstudio.com.

Fox's Rebecca Grant

Rebecca Grant of Fox's *Under the Helmet* series and host of *Superbowl.com TV* remembers walking into the webcast set at the NFL Experience and being floored by its size. "It was huge," Rebecca says. "The whole thing was professionally produced from the start. It was a little intimidating at first, especially knowing it was before a live, studio audience and worldwide audience, but once we got rolling, everything fell into place."

Grant has fond memories of her first webcast hosting experience, but one really sticks out in her mind. "My co-host, Aaron Taylor, suddenly put me on the spot during the live show and asked about my pick for the Super Bowl. I gave it, and you know what? I nailed it, and the show is archived on the Web, so the evidence is there."

Grant thought the four-day event went smoothly, considering all the technology and personnel involved. "The interactive elements were the best," she says. "We got to take email questions from fans, and that's when it hit me how global this webcast really was. We got questions from as far away as Germany. The worldwide interest was especially high considering this is such a traditional American event. Doing it live with an audience really pumped it up; we got them worked into a frenzy, especially on the last webcast, a day before the Super Bowl. Energy was peaking."

Aside from the live show, Grant did packaged pieces that ran through the series. Her favorite was the piece on Media Day, where hundreds of journalists have full access to the players. "We made it fun, and did a lot with the interviews," she says, "and it played great in the webcast show. Like every other element, it was slick and professionally produced".

Grant credits the success to really good online and broadcast advertising. The momentum for the buildup to the webcast and the Super Bowl made the whole project exciting. What's next for her pertaining to the Web? "NFLFILMSTV wants to do it again next year, and I am definitely ready," she says. "I'd love to see it expand from a half hour to a full hour, so we'll have more time with the guests, and like any other program they do, next year's webcast is just going to bigger and better than the last."

Traffic Cop Technology

RealNetworks' RealSystem iQ Outsmarts Gridlock

AS THE INTERNET GROWS, SO DOES the amount of congestion. During high traffic times, such as during the day, even broadband users are experiencing slowdowns. While merely an inconvenience when waiting a few extra seconds for a page to load, slowdowns can be disruptive when trying to view streaming content, especially while waiting for your player to buffer and reconnect after a usage spike knocks the content into a holding pattern. RealNetworks is working to eliminate slowdowns with the introduction of RealSystem iQ, a self-aware digital media network that allows streaming content to be injected into the hive of network servers at any point, and then deployed back out to anywhere. The system provides content quickly and without being affected by Internet traffic jams.

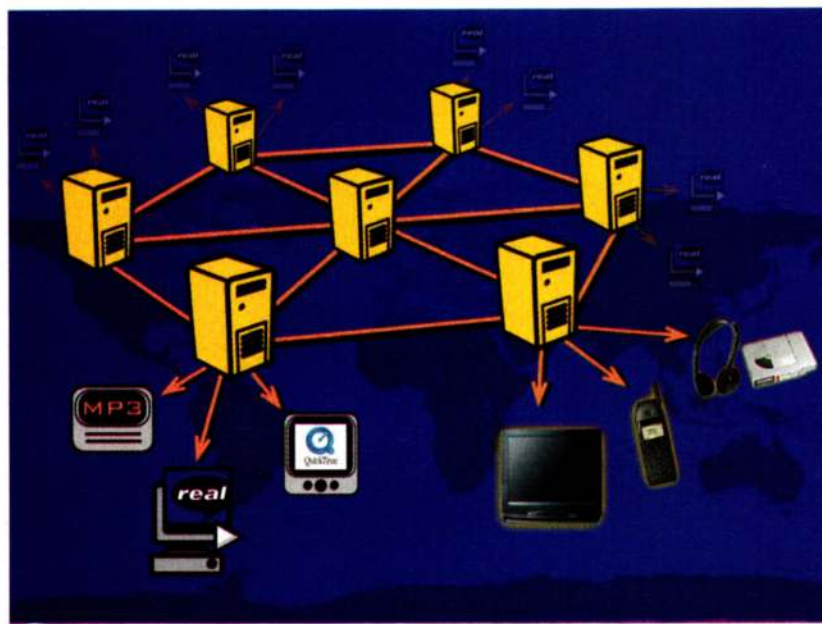
Currently, streaming is based on a

network of origin and edge servers that provide one-way communication from the server to the player. The Internet has many lanes for traffic, so, typically, slowdowns have not been too much of a problem; however, when congestion does occur, users experience sluggish performance or lockouts in what can be called a virtual traffic jam. During every record-breaking Victoria's Secret fashion event or live Madonna concert, there are thousands of fans who have trouble logging on to see the show, nullifying the interactive edge that separates the Web from traditional broadcasts. In the past several years, RealNetworks has worked to help eliminate most of these problems, offering better quality at lower rates with each subsequent release of player and server software. The company also developed RealSystem G2, an intelligent streaming technique that ensures that users automatically will be

able to see and hear streaming content at the highest bandwidth available to them.

In addition, Real Networks has developed RealSystem iQ, increasing the usability, flexibility, scalability, reliability, and quality of streaming content events. Real System iQ focuses on the future of the network, bringing streaming content to many wired and wireless devices, not just personal computers. Using Neuralcast Technology to combine the power of many servers into one super server, RealSystem iQ essentially forms a self-aware network. The network can make instantaneous decisions on how to best perform and optimize the flow of streaming content and also provides uptime guarantees, as streaming content is covered in the event a capacity failover knocks a server off the network. RealSystem iQ also allows up to 100% reliability through error-correcting codes in live stream distribution, as well as on-the-fly, remote, configuration monitoring that keeps administrative costs down. The system intelligently distributes content throughout the network via live distribution.

Real's system is backed by wide support for multiple formats, ensuring that a large cross section of users have access to streaming content. Aside from the not-too-surprising absence of support for Windows Media, the server can pump out more than 45 media types, including RealMedia, Flash 4, and streaming MP3. With the addition of Flash 4, content creators can produce vector-based presentations in RealPlayer while incorporating all types of video and audio. The server software can stream out CD-quality audio at 64Kbps and VHS-quality video at typical broadband rates. RealSystem iQ also provides a fairly open cross-



The RealSystem iQ network uses Neuralcast Technology to combine the power of many servers into one server to produce a self-aware network that makes instantaneous decisions on how to best perform and optimize the flow of streaming content to multiple devices.

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platform architecture with support for 11 operating systems, including Windows 2000, Windows NT, Linux, Solaris, and IRIX. The application also supports over 1,000 APIs and currently boasts more than 800 products that work with the system, shipping now from various third party companies and alliances.


The backbone of RealSystem iQ is the RealSystem Server, newly released as version 8. RealServer now incorporates the NeuralCast live distribution and communications protocol. Live distribution is handled through the network of RealServers, with error correction and terrestrial and satellite multicast support. Multiprotocol transmission between servers ensures uninterrupted and reliable delivery of streaming content. Communications protocol is the information-exchanging and decision-making ability of the RealServers network. For example, decisions made by the network include capacity sharing, covering for a server maxed out due to increased use, and equipment coverage, using a server to run in place of another server with technical problems or a power outage. RealServer can now broadcast live redundancy streams, repeatedly sending a signal to cover for another server in the event of a broadcast overload or network outage.

There are several additional features for RealServer that set it apart from other, similar solutions. Optimization for connectionless transmissions is one such feature. Live broadcast

distribution is optimized to write streaming content via packets over a network in a unidirectional method, not requiring the system receiving the packets to acknowledge the arrival. Traditional systems require a persistent TCP connection between the sender and receiver. RealServer, however, offers a single, one-way network path between the two, allowing a restored interruption to continue without restarting or resending information by inserting all of the information the receiver needs for the live streaming content into a one-way packet flow. The information includes session description, stream data info, and error correction data called Forward Error Correction (FEC), allowing users to reclaim lost packets in real time. This means that if there is Internet congestion, the packets will still arrive at players without having to be resent. The most important aspect of this feature is that the amount of FEC data is configurable, i.e., FEC can be tailored to the type of broadcast: more for large events and less for small-scale broadcasts with a smaller audience. In addition, RealServer supports rerouting. If the packets stall because the stream hits a disruption along the path, the system will reroute to an alternate path. Live broadcasts can be detoured quickly and instantly without interrupting the broadcast to resend the packets.

RealSystem iQ allows RealServer to stream QuickTime 4 content. This alliance between Apple and Real can help fend off the unrelenting rise of the

Windows Media file type. There are two considerations if you want to provide QuickTime content while taking advantage of the RealServer technologies. First, in QuickTime, RealServer does not recognize any tracks aside from audio and video, including effects, text tracks, and scripting. Second, the coding of the clips dictates how Apple movies will play. For example, QuickTime player, but not RealPlayer, will play clips that have been encoded with proprietary codecs other than Apple's own. If the clip has been compressed using codecs such as Sorenson, Cinepack, Qdesign, or Qualcomm, it can be deployed from RealServer, but the user must receive it using the Apple QuickTime Player. For RealPlayer to play back the content, the clip must be encoded using one of the standards-based codecs, such as h.261, h.263, or MP3. In other words, if the clips are encoded using the standard Apple compression, they can be served to RealPlayer. Clips encoded by other third-party codecs will have to play through the QuickTime Player. Using one player, locally or globally, to serve RealVideo, RealAudio, and Apple's QuickTime is a great option.

Real Networks (www.realn timers.com) has consistently shown that it is a major leader in the advancement of streaming content, and its latest product upholds that reputation. Similar to RealPlayer's scaled-down version, a modest version of the RealSystem Server is available for free. Only 25 concurrent users can be served from this version, but at least it offers a chance to become familiar with the technology. There are also other versions, such as RealSystem Server 8 Plus, RealSystem Server 8 Professional, and RealSystem Server 8 Intranet, which cover most administrators' needs. All feature the RealSystem iQ components with Neuralcast Technology, creating a network of servers that talk to each other and intelligently work together as one. Also available at the RealNetworks site is a rich abundance of content and white papers for learning more about and deploying these exciting new technologies. 

Contributing editor Frank McMahon is a media artist specializing in directing, editing, animation, and graphic design.

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Watch a brief demonstration of how RealSystem iQ works.

Content and information on RealNetworks' technology is available at www.realn timers.com.

It's the quintessential Las Vegas tradition catching the headliner that everybody wants to see and hear. CTIA WIRELESS 2001 extends that tradition with this exciting line-up of keynote guests. These CEO's, the leaders of some of the world's most influential and profitable corporations, will share their insights during informal conversations with CTIA's president Tom Wheeler.

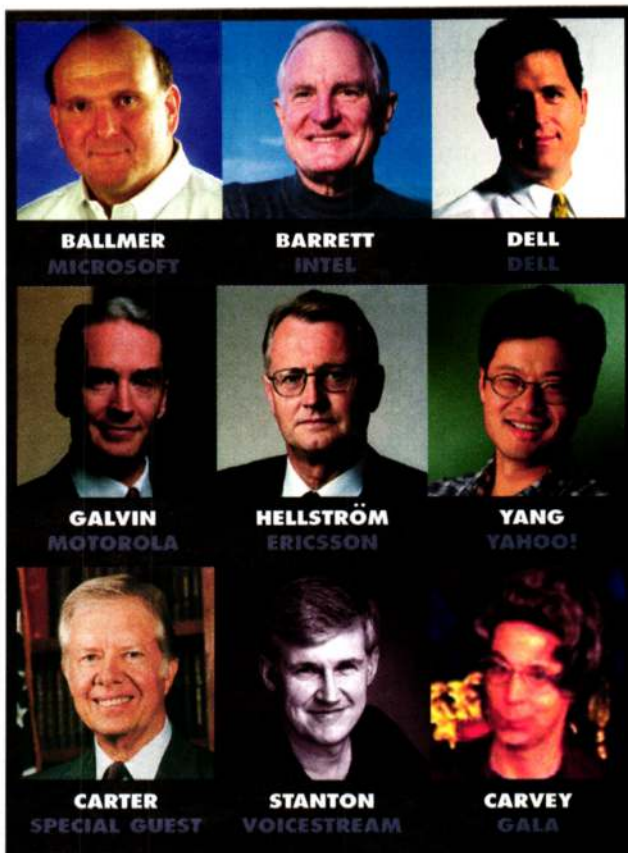
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Free Tools for Audio Editing

EVEN IF YOU SPEND MOST OF YOUR professional life producing and editing video content, there will come a time when you or one of your staff will need to perform some surgical audio editing. Many streaming professionals use the simple audio-editing tools available to them in their NLE program to make minor changes in a soundtrack. While these are adequate for this purpose, it is

video frame boundary, from a sentence. At this point, nothing beats a dedicated software audio editor for cleaning up, reorganizing, and enhancing audio tracks.

Fortunately, there are a host of audio editors available at little or no cost. Most of them come equipped with at least a few audio special effects, either built in directly or offered as software

television work, and Digidesign shows no signs of slowing as it recently released a new version of its pro software with full 5.1 surround capabilities. Media giants like Liberty Media, a multinational company that now has significant holdings in the Los Angeles post-production community, have standardized Pro Tools to ensure compatibility between their facilities and to lower employee training costs. Unfortunately, a full-blown professional Pro Tools TDM rig can cost over \$25,000, putting it out of reach for smaller video production companies. Last December, however, Digidesign released Pro Tools FREE, a limited version of their industry-standard audio-editing software solution. The software is not only free, but Pro Tools FREE does not require any of Digidesign's proprietary and expensive hardware, so video editors have no excuse not to use a competent audio editor when needed.

Pro Tools FREE is limited to a total of eight audio tracks (as well as 48 MIDI tracks), and there is no provision for locking to SMPTE time code. However, the software can play a Quicktime movie of your video in a separate window within Pro Tools FREE, and, for short video segments, the lack of time-code lockup is manageable. Moreover, edited session files from Pro Tools FREE are compatible with other professional versions of Pro Tools, so you can always take your tracks to a post facility for conforming, if necessary. In any event, you should be able to export your audio tracks, edit them in Pro Tools FREE, and import them back into your project with no ill effects.

Pro Tools FREE runs on both Macintosh and PC computers, using either the Mac's native Sound Manager or standard Windows sound drivers in

(Continued on page 78)



ProTools PTX's edit and mixer interface screens.

often the case that a simple cut, paste, and level adjustment will not be sufficient. For example, you may need to reduce or eliminate background noise without altering the sound of the voiceover; apply a good-sounding compressor to level the volume peaks of your soundtrack without squashing the whole track; judiciously apply reverb or delay to make a music bed seem larger and more spacious than the original recording; remove just a small syllable, which unfortunately doesn't occur on a

plug-ins that work within the host program. Without exception, these dedicated audio editors are all more competent than the audio editing functions of most NLEs, which shouldn't come as a surprise.

Pro Tools FREE

Pro Tools from Digidesign, a division of Avid, is the 800-pound gorilla of software audio editors. Pro Tools has become the defacto standard for audio post in theatrical films and

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(Continued from page 74)

conjunction with any of several sound cards for the PC. The software comes with five plug-ins, including EQ, compression and limiting, and delays. You can buy additional plug-in effects from third-party vendors to further extend the capabilities of the software.

While the computer requirements for Pro Tools FREE are less stringent than are the requirements for most video NLEs, they're not inconsequential. You'll still need a PowerMac G3 or G4, running at 300MHz or better; or a Pentium III, running Windows 98 or Windows ME at 500MHz or more. You'll also need a minimum of 128MB of RAM and a large, fast hard drive for storing the audio.

If you are already using a video NLE program, then your computer likely

the Mac platform and will introduce you to the wonders of software audio editing at no cost. The Windows version of Pro Tools FREE, however, is not quite as stable as the Mac version and is somewhat tricky to set up due to the wide variety of PC hardware and Windows configurations in use. It is definitely worth a bit of time and effort to get Pro Tools FREE up and running on your PC. Let's face it, we would all like to use the same software that was used to create the surround audio for *The Matrix*, wouldn't we?

You can download Pro Tools FREE from Digidesign's site (www.digidesign.com). You'll also find technical support and online user discussion forums, both of which will answer any questions you may have. For those who work on the Mac platform there are other free or low-cost editors

shareware price tag of \$69. Cool Edit 2000 includes a lot of features for that princely sum, such as 20 built-in effects, for example reverb and echo, equalization and filtering, and even time-compression and time-expansion. The latter can be a lifesaver, as it stretches or shrinks the length of a sound without affecting its sound quality or pitch.

While Cool Edit 2000's default format is WAV, it can handle nearly any digital audio format, including the AIFF format, meaning you should have no trouble editing your soundtrack and then re-importing it into an Avid or Media100 system.

Cool Edit 2000 has many audio editing features, including cut, copy, paste, delete, trim, and more. It also includes some interesting and useful twists, including five internal clipboards for storing bits to be used elsewhere, much like the trim bin function of an NLE. It can also use the Windows clipboard. While Cool Edit 2000 is a stereo editor, the company offers a \$49 plug-in called Studio that adds a four-channel mixer. This allows Cool Edit 2000 to mix and play back four tracks at once, for a grand total of \$118.

The program's system requirements are modest, able to run on a Pentium II or III processor, and requiring a mere 16MB of free RAM (although more RAM improves its performance). The program also runs on Windows 95/98, ME, NT, and 2000 and supports Microsoft's DirectX, so you can use any DirectX plug-in. All installed DirectX plug-ins appear in the Transform menu, the same as the built-in effects. There are hundreds of DirectX plug-ins available from other manufacturers, and Syntrillium includes a DirectX Tremolo plug-in to get you started.

Syntrillium also has an extensive website (www.syntrillium.com) with support for the product. A section called Cool School features tutorials that are designed to be downloaded and viewed within Cool Edit 2000. Cool School represents some of the best online help available anywhere. You can check out Cool Edit 2000 at the Syntrillium website www.syntrillium.com.



Cool Edit 2000 includes 20 built-in effects, such as reverb and echo, equalization and filtering, and time-compression and time-expansion.

meets those requirements. For instance, assuming you have space available, you can probably use the same hard drive you normally use for captured video. Digital audio uses a little over 5.5MB of disk space per minute at 16 bits and a 48KHz sampling rate, and you'll need at least twice that much to store temporary edit files.

Pro Tools FREE is stable and an obvious choice for editors working on

available for the Mac, but with the release of Pro Tools FREE there is little reason to look elsewhere. If you are put off at the mention of Pro Tools having some troubles on Windows, there are good alternatives available for the Wintel platform.

Cool Edit 2000

Syntrillium Software's Cool Edit 2000 is a stereo audio editor with a

Plug-ins Add Functions

One of the best reasons to use a software audio editor is that you can add features to the software by adding plug-ins. Almost any sort of audio effect or processor – reverbs and compressors to EQ and flangers – is available as a file that goes in a folder labeled *Plug-ins*. Best of all, many plug-ins are available on the Internet for free or for a small shareware fee.

Most audio editing software includes a number of plug-ins as standard equipment. You can easily add to this collection, provided you pay attention to the plug-in format required by your audio editing program. For Pro Tools FREE, look for plug-ins in either AudioSuite (AS) format or in RealTime AudioSuite (RTAS) format. Be advised that AS and RTAS plug-ins are nearly all commercial products, but some carry modest prices. Go to the product section of Digidesign's website and look at the product section at

(www.digidesign.com/products/products.cfm) for a list of third-party plug-ins for Pro Tools FREE. If you're using an editor that supports Microsoft's DirectX format on the PC, your choice of inexpensive plug-ins is much wider. For starters, visit the oddly-named DaveCentral website (www.davecentral.com/audplug.html). There you'll find over 40 links to free or inexpensive audio plug-ins, including many in the DirectX format.

Virtual Studio Technology (VST) is another popular plug-in format for both Mac and Wintel platforms. According to VST's developer, Steinberg Media Technologies AG, there are over 300 VST plug-ins available for Mac and PC workstations. VST plug-ins currently run on Power Macintosh, Windows 95/98, and NT 4.0. You can get more information on VST at Steinberg's website (www.steinberg.net/), where you can also check out nearly two dozen of

Steinberg's commercial plug-in offerings. For free or shareware VST-format plug-ins, go to the plug-in section of the Cubase FAQ at (www.CubaseFAQ.com/links/plugin.htm). This page has dozens of links to both free and commercial VST plug-ins for Mac and PC.

The definitive audio shareware website is Shareware Music Machine (www.bitsquad.com/smm/). This site features links to hundreds of free or inexpensive audio editors and plug-ins for PC and Mac platforms, as well as dozens of demo versions of commercial editors.

By spending a little time surfing the Web and just a little money, you can equip your production room with a powerful set of audio editing tools that will allow you to handle any audio issue that arises. ☐

Steve Cunningham, a regular contributor to *netmedia*, is proprietor of Acme Voice Works in Los Angeles. He produces radio commercials and video projects for the Internet.



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enhancements or personal settings pre-loaded in CallManager. Price: Not available. (Milpitas, CA; 408-526-9000; www.polycom.com)

CONTENT CREATION

Broadcast/Webcast Systems

By viz|rt

vi[z]: This real-time broadcast graphics system delivers professional capabilities on Windows and SGI-based hardware, according to the company. Combined with other modules, users can create and manage all graphic needs. Available modules include the following: vi[z] virtual studio, a virtual studio system; vi[z] content pilot for the control and instant modification of graphics; vi[z] modeling for creating and delivering content; and vi[z] maps for rapid creation of broadcast-quality maps to illustrate breaking news stories. Starting price: \$20,000. (New York; 212-463-9902; www.vizrt.com)

MPEG4 Compression

By DiamondBack Vision

ObjectVideo: At the core of this technology is the ability to automatically segment foreground and background objects within video, enabling 56Kbps dial-up Internet users to experience high-quality streaming video. Dial-up users can watch streaming video in a frame that is more than four times larger than typical narrowband frames, with smoother playback, no jerkiness, and sharper video images, according to the company. Price: Not available. (Reston, VA; 703-654-9322; www.objectvideo.com)

Interactive Streaming Video

By Hypnotizer

hypnotizer.editor: One of three components that comprise the Interactive Streaming Suite, this software enables Web designers to overlay interactive elements, such as clickable icons, pulldown menus, logos, banners, and text, onto video streams. According to the company, its ease of use is based on common WYSIWYG design principles, and it can deliver interactivity to the viewer at the click of a mouse. Applications include the addition of "Buy now" buttons to video commercials, subtitles to films, the placement of personalized banner advertisement within a video, or the inclusion of further information, such as statistics, in a live sporting event. Price: \$390. (San Francisco; 866-AT-HYPNO; www.hypnotizer.net)



COMMUNICATIONS & PRESENTATIONS

Streaming Systems for Business

By ViewCast.com

Niagara: These preconfigured, integrated streaming systems come in industry-standard, rackmounted configurations (1U, 2U, or 4U) or as portable systems targeted for remote webcasting of live events. The system uses Osprey-220 professional analog A/V capture cards that enable CD-quality audio and professional analog capture of video and audio signals for streaming media applications. These systems are compatible with most consumer and professional A/V input devices, including cameras, VCRs, and VTRs. The systems come equipped with either RealProducer Plus V8 or (when configured with the Osprey-500 card) Windows Media Encoder V7 streaming encoder applications. Price: Not available. (Dallas; 972-488-7200; www.viewcast.com)

Modeling & Painting

By Pixologic

Zbrush 1.1: Based on Pixel rendering technology, this product enables an artist to paint an image with depth and push/pull sections, create and move lights, change the materials, and apply 2D and 3D effects in one integrated, real-time workspace. Features include 2D/3D export/import, 3D masking, customizable lights and material properties, interactive Z Graph technology, 3D texture grab, 3D picker,



CONTENT PREPARATION & MANAGEMENT

Digital Video Indexing

By MediaSite

Publisher 4.1: This version offers real-time speech recognition technology, which can be used to add speech information to video or to synchronize close-captioned data with audio tracks. Users can encode to more multiple streaming formats simultaneously, including combinations of RealVideo, Windows Media, MPEG1, MPEG2, and AVI. This version also includes automation interfaces for developers who want to expand on the product's automated features. Price: Not available. (San Jose, CA; 412-288-9910; www.mediasite.com)

3D deformations, and more. This software requires a minimum of 200MHz PII or PPC, G3 processor, 128MB of RAM, 1,024x768 monitor set to millions of colors and System 8.1 or later. The introductory price is \$292.50. It can only be purchased and downloaded online (ESD format). (Los Angeles; 213-748-0990; www.pixologic.com)

Clickable Content

By Orad

Clickable Video: This product is an interactive system that uses the company's tracking technology to place clickable zones in live video. The tracking technology allows dynamic hot spots to move freely on the video in association with either real or virtual objects, without the need to insert hot spots frame by frame. Viewers can click on the video area itself rather than on side graphic buttons and are able to influence the outcome of a show they are watching by clicking on the video in real time. The application is designed for use in the webcasting of

news, sports, and related production programs. It can also be used for interactive merchandising. Price: Not available. (New York; 212-931-6723; www.orad-ny.com)

CONTENT PREPARATION & MANAGEMENT

Webcasting Systems

By Media Management Systems

EarthCaster: This line of video and audio encoders incorporates hardware-assisted encoding, professional I/O, and real-time A/V processing to create near-VHS quality with DSL, cable modem, and faster connections. The encoders provide multiple, high-quality simultaneous Internet media streams in RealNetworks and Microsoft Windows Media formats. The product is available in 1RU, 2RU, and 3RU configurations. Starting price: \$5,995. (Atlanta; 770-979-8855; www.earthcaster.net)

Content Management

By Digital Lava

vPublisher: High-volume content producers can publish interactive rich media communications in either of the company's interfaces: VideoVisor Web or VideoVisor Professional. Digital video/audio, PowerPoint slides, subtitles, text, graphics, animations, software demonstrations, office applications, Java applets, and websites can be seamlessly combined, linked, and synchronized into interactive rich-media applications. The product's drag-and-drop functionality provides the ability to quickly assimilate disparate media assets, organize content, create links, and rapidly publish data. Price: Not available. (Marina del Rey, CA; 310-577-0200; www.digitallava.com)

Streaming Media Analysis

By Pictro

Media Gateway Suite: This product uses intelligent video analysis technology to automatically encode

Real, Microsoft, and QuickTime formats from multiple stream rates into multiple bit rates, in real time. Users can index, catalog, and summarize video content resulting in streaming media that is searchable on the Web. The media analysis module provides face, object, and video OCR text recognition. Image

features, such as color, shape, and texture, are pulled from keyframe images to index the visual content. Video scene changes are automatically detected, and representative keyframes are extracted, summarizing the video content into a storyboard format. Price: Not available. (San Jose, CA; 408-777-8111; www.pictron.com)

CONTENT DELIVERY

Audio/Video Over IP

By Leitch

TrueCircuit: This patent-pending technology involves conditioning real-time traffic before it is transmitted on the medium, automatically and instantaneously setting up and tearing down protected virtual channels within an IP network or Ethernet LAN. For facilities with a single IP network, the PG1 Gigabit Ethernet Gateway delivers high-bandwidth isochronous and

asynchronous data to a TrueCircuit Gigabit network. It supports uncompressed Serial Digital components, three AES/EBU audio channels, one 10/100Base-TX port, one RS-232 port, and a single composite interface. The PG1 gateway interfaces to multimode fiber-optic or CAT5-capable Ethernet devices. Price: Not available. (Chesapeake, VA; 800-231-9673; www.leitch.com)

RAID Controllers

By CMD Technology

CRD-7400/7040: The CRD-7400 Fibre Channel-to-Fibre Channel and CRD-7040 Ultra 160 SCSI RAID controllers are the newest additions to the company's TitanTM family of RAID controllers. The OS-independent 7400 supports two Fibre Channel (FC-AL) disk ports with up to 248 Fibre Channel disk drives, while the 7040 supports two Ultra 160 SCSI host channels, two Ultra 160 SCSI disk channels, and up to



CONTENT PREPARATION & MANAGEMENT

Linux Streams

By SGI

Kasenna MediaBase: This platform for multiformat streaming, content management, and content transfer is now available for Linux OS-based servers. It supports such common streaming formats as MPEG1, MPEG2, RealVideo, RealAudio, QuickTime, and MP3. The product is a fully scalable media server that is designed to deliver innovative Internet-based content. Kasenna MediaBase is ideal for customers with applications involving corporate training, distance learning, online media archival, and immersive audio and video Web content, according to the company. Price: \$11,000 for a 100-stream license. (Mountain View, CA; 650-960-1980; www.sgi.com)



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Welcome to your personal control panel for flipping! From here, you can encode and distribute multiple streaming media formats.

Choose an account from the menu or create a new one. FlipFactory makes it easy!

CONTENT PREPARATION & MANAGEMENT

Automated Formatting and Delivery Software

By Telestream

FlipFactory: Intended for corporate communications departments, the television and entertainment industries, and Internet service providers, this software simultaneously transcodes source video into multiple streaming formats and bit rates and sends it to FTP servers, Web servers, caching networks, and individual mailboxes in the format each destination requires. High-quality video, created in any source format, is automatically recoded by the software and delivered to servers for distribution anywhere with an Internet connection. The scalable software runs on a Windows NT or Windows 2000 server. Base price: \$19,500 per server. (Nevada City, CA; 530-470-1300; www.telestream.net)

28 SCSI drives. The 7400 feature set includes single or dual hot-pluggable controller configurations with active/active or active/passive flexibility. The 7040 features redundant, hot-swappable controllers and combines the company's failover model with Ultra 160 SCSI for use in demanding storage environments. Price: Not available. (Irvine, CA; 949-454-0800; www.cmd.com)

Digital Media Delivery

By RealNetworks

RealSystem iQ: This standards-based foundational architecture increases the reliability of Internet broadcasts, scales to the largest audiences possible, and provides flexibility and cost-effectiveness for media delivery network deployments. Neuralcast Technology creates honeycombs of distributed interconnected servers and empowers all servers to broadcast into the network, receive content from any other server, and deliver media to end consumers. The system architecture can enable the transport and delivery of all media types. Price: Not available. (Seattle; 206-674-2700; www.real.com)

Narrow-Bandwidth Video Streaming

By ON-AIR A/S

ON-AIR Video Communicator: This technology enables a laptop with a cellular telephone as the transmission line to view real-time video in a narrow bandwidth (as low as 9.6Kbps with 3frames/sec to 5frames/sec). This product consists of an ON-AIR Server to compress the video signals and an ON-AIR client to decompress the video signals to real-time video. If the client is not installed at the receiving computer, the real-time video can be seen via a Java applet or plug in. Price: Not available. (Aalborg, Denmark; +45 70 204 203; www.onair-dk.com)

Delivery Platform

By Yahoo!

Yahoo! Webcast Studio: This platform combines the entire suite of Internet broadcasting services and tools that Yahoo! provides to its company-clients through its streaming services division.

The tools include several audience-tracking applications, such as Self-Serve Reporting, Presentation Manager, Question Manager, and Polling Manager. New features that the product can build into a webcast include: automatic detection of the end user's media player; automatic detection of the end user's optimal bandwidth; and an automatic slide synchronization feature that allows for the archive of a live event to be available as soon as the event has ended. Price: Not available. (Santa Clara, CA; 214-782-4444; www.yahoo.com)

IP Distance Learning

By 2netFX and Zapex Technologies

StreamRider/ThunderCast/IP/ZL-330: This Linux-based system provides a means to stream broadcast-quality transmissions. The system comprises StreamRider client and ThunderCast/IP server software and the ZL-330 encoder with Dolby digital audio and MPEG2 video. The encoder eliminates inherent lip-sync issues by providing Transport Stream multiplexing within the encoder. Price: Not available. (Mountain View, CA; 650-930-1300; www.2netFX.com; www.zapex.net)

Server Technologies

By Vingage

Video Server 4.0 and DVD Fulfillment Server 3.0: Video Server 4.0 streams all major formats through real-time transcoding and delivery from a single file. It uses transparent user identification of the viewer's environment, discerning the appropriate streaming player, device platform, and connection speed. The system also allows video assets to be stored in single, high-quality files. As new video formats are updated and introduced, the stored video files are automatically updated. The DVD Fulfillment Server enables content providers to offer their customers the ability to pick and choose online video content. Once confirmed, the DVD server automatically authors and records professional-quality DVDs. Price: Not available. (Reston, VA; 703-438-7500; www.vingage.com)

SERVICE PROVIDERS

IP Conferencing Services

By V-SPAN

OnNet IP Conferencing Services:

This service allows businesses, educational institutions, and government organizations to communicate using videoconferencing endpoints via IP networks for meetings, events, and training. It connects multiple endpoints via multipoint bridging devices with features that allow participants to view all sites simultaneously. The OnNet Gateway services allow organizations to easily communicate with disparate broadband (IP) and legacy circuit-switched networks (ISDN), in turn allowing interoperability with any conferencing system. In conjunction with the release, the company says it is enhancing its Meeting Center Web portal to include self-managed IP conferencing with such features as enterprise directory services, event notifications, and on-demand or scheduled call-launching capabilities. Price: Not available. (King of Prussia, PA; 888-44V-SPAN; www.v-span.com)

Streaming Service

By Eyecast

EyeView 6.0: This streaming media service is based on MPEG4 standards and incorporates proprietary streaming technology that runs 30x faster than earlier version of 30frames/sec, according to the company. The service is designed to deliver secure access to video content from any computer linked to the Internet for such business applications as remote merchandising, marketing, visual collaboration, security, loss prevention, and asset management. The product offers pan, tilt, and zoom capabilities. Users can remotely control cameras from any location via standard Web browser, share video simultaneously with authorized users and digitally store and archive video in the company's video warehouse. Monthly pricing: \$50 to \$200 per camera, depending on frame rate, storage length, and number of cameras. (Herndon, VA; 703-456-4873; www.eyecast.com)

When you look at the adult business models, it's all about moving traffic. And about sharing traffic. You'll find arch competitors sharing traffic. It's very communal.



Nicolas Sage

(Continued from page 41)

type of store. You can't have your toothpaste." And that's the situation that we're in until we find some sort of cash system that gets wide adoption.

netmedia: Now there are companies, like Qpass and CyberCash, that offer various e-cash solutions.

Don't they solve the problem?

Danni: Well, they all have their good points, and they all have their weaknesses. But the one big weakness that they all share is that none of them are getting it into the hands of consumers.

For a cash system to work, everybody has to have it. Right now, there are maybe 15 different e-cash systems, and as a merchant, it's not feasible to try and support all 15. All of those 15 e-cash merchants probably have only penetrated maybe 5% of the consumers. So, it's like what's going to come first, the chicken or the egg? How do you get this stuff into consumer's hands? How do you get them to download the wallets and start using this system? Because it's not until the customers start using it that the merchant's are going start offering it. And vice versa.

netmedia: Now, in terms of what mainstream entertainment websites can learn from the adult community, the obvious question is, is there something

they can learn, or are adult entertainment sites so successful simply because sex sells?

Danni: That's true, but that's only part of it. I think one of the real reasons for our success on the Internet is necessity. We don't have the cushion of having a lot of money behind us, so we don't have the luxury of being able to screw off and waste a bunch of money. We have to cut to the chase. You have to figure out what people want, and you have to sell it to them as quickly and as efficiently as you can. And I think in the mainstream Internet world, that's kind of been lost. Everybody's so busy making things cool, so busy trying to entice and satisfy investors that they haven't really gotten down to the dull business of creating a business, the business of servicing your customers.

netmedia: Is it possible for mainstream entertainment sites to create a successful business model, or is there no content beyond sex and maybe sports that's compelling enough to make it viable?

Danni: Sure, they can do it. I just think they need to get a lot more realistic. You have to stop trying to sell things that people don't want, and you have to start making it easier for them to get the things that they do want.

It's just a question of getting practical. I think in-web video is a really good example. I can't think of one example of a business in the mainstream world that's using in-web streaming video. They're all using plug-ins. But what we know is if you give people a choice to watch this video on Real Video or as an in-web video, 90% of them will watch it in-web because it's easier. And it's much less expensive to develop and maintain.

netmedia: In terms of business models that are working in the adult entertainment industry, what are some of the different ones that exist? They're not all run the way you run your business, isn't that right?

Danni: There are really four predominant business models. The first is the free site, which is the model used by the largest number of sites. There are hundreds of thousands of little mom-and-pop free sites that will offer a certain amount of free content to generate traffic. They'll then take that traffic and trade it with other free sites to generate more traffic. And then they'll skim some of that traffic and sell it to pay sites, and that's how they make their money. So they use a lot of networking and giving away of free content to generate large pools of traffic, then they'll sell off some of that traffic to pay sites who will then try to sell the visitor a subscription.

netmedia: And the free sites sell traffic to the pay sites through a banner placement or something like that?

Danni: Yes, through different variations of affiliate programs and banner programs. Now, between the free sites and the pay sites, there's these sort of like network sites, which act almost like routers. They find ways to get all the free sites to link to them and then they sort of re-route the traffic back out according to some system. That's just another way of moving the traffic around. Really, when you look at the adult business models, it's all about moving traffic. And about sharing traffic. You'll find arch competitors sharing traffic. It's very communal.



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netmedia: Which is a big difference, I would say, from the mainstream sites, where you really don't see that at all.

Danni: The reason the sharing of traffic is so important is that you have to have a lot of eyeballs because the conversion rates are so low – which is largely a function of the problems with the payment system that we talked about. We only sell three or four subscriptions per thousand visitors. That means you've got to have a lot of people visiting the site to make a business work. So adult websites have gotten good at moving that traffic around and making sure they get as many eyeballs looking at their page as possible.

So you've got these small free sites that are generating traffic. Then you have the network sites, which are sort of routing the traffic around. And then you have the pay sites, which are in the business of selling subscriptions. They will try and sell a subscription to a visitor, and often times if they are unable to, they will then resell the traffic to another pay site, which will then resell the traffic to another pay site. And that's what gets you into those annoying pop-up consoles that you can't get out of. That's the practice of selling exit traffic.

Then, the fourth type of business model are the content syndicates, which are the companies that produce the live feeds, the 24-hour live feeds, the live chat feeds, and the photo archives and various video clip archives. These companies specialize in creating and packaging content that they then sell to pay sites. So there are a lot of pay sites that just buy all of their content from syndicators and then buy all of their traffic from other sites. And so basically what they're doing is just playing a numbers game. You buy your content, and then you buy your traffic, and if you keep the ratios just right, you'll make money.

Danni's Hard Drive is very different in that respect in that we have a whole different perspective on how we approach the

business in that we're looking to build a brand, looking to build a destination. And so we don't buy very much traffic, and we don't buy very much content. It's much more about creating an area that people really enjoy and feel safe and want to revisit. That's the one thing that really sets us apart and makes us very different.

netmedia: Tell me more about that. How do you distinguish yourself with so much competition out there in the adult world?

Danni: Well we stand out in a lot of ways. One, by being very softcore. We really stick to our guns about softcore, which makes us pretty unique. I think Danni's Hard Drive is a place where the wife isn't going to mind anywhere near as much. You know, we're kind of like *Playboy* in that respect. We have a lot of couples visiting, and it's a very nice, funny, happy, well-lit place. In other places, where the whole subject matter is treated less respectfully and with less fun, you might start going, "Eew, what am I doing here? Why am I doing this?" So it's very important to me to create that environment that's very positive and inviting and very focused on the models as people and personalities. I mean, we certainly expose their bodies and do all the traditional things in that regard, but we add that extra element of, OK, this is who she is as a person, and she has a sense of humor; she tells jokes. You know, she's a cool person. So there's that, and there's the fact that we're brand building rather than just turning traffic. To us, it's more of a brand building game than a numbers game.

netmedia: So when all is said and done, would it be wrong for anybody to conclude that it is, in fact, easy to run an adult site? That all you have to do is get a computer, put up some sexy pictures, and you'll make money?

Danni: That might have been the case five years ago. It's not the case any more. The market is flooded. Now there are hundreds of thousands of sites. And you know, like any business, there's only so much to go around. It's not that easy to just walk in and make money. There are lots of people failing. I think there's always room for a new idea, a fresh angle, but for anyone who thinks they're just going to copycat their way into success, that window of opportunity is gone.

netmedia: Where do you take the site from here?

Danni: We're looking at a lot of ways of expanding it, and really it's kind of a 50/50 split between exploiting our technology and continuing to build the brand. We have the DanniVision technology that a lot of people have shown interest in. We're considering packaging it for other people to use. We've been very successful at offering our credit card processing technology and our hosting technologies to other businesses. We lease our studio to other businesses. So there's all of that sort of thing. Then there's taking the Danni brand and moving it into a videotape line, moving it into cable and pay-per-view, moving it into foreign language editions. Just looking for ways to expand the business and the brand. ☺

Stephen Porter is the editor of *netmedia*.



Julie Strain

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Molinari: Well, the fact is, only a small number of Americans for the next several years are going to have access to bandwidth that technically permits a television viewing experience. Anyway, I think it's questionable why we need to watch television on a computer monitor. I think what's more compelling is providing rich media that enhances the Web experience that people in the past few years have only just begun to expect. So, making streaming about Web development, not about television per se, is our focus. That said, we're not looking to dumb down that content; we're looking to produce streams that are of extremely high quality regardless of data rate connections and regardless of player format or any other underlying technology. Whatever compression method they're using, we want to provide streams that are of high quality with a good end experience for the viewer.

What do you feel is the single largest factor inhibiting the growth of Internet streaming?

Savello: Streaming has come a long way in the last 18 months, and the growth projections for this year are pretty strong as well, but the market could be growing even faster if not for the rather slow adoption of broadband technology. DSL and cable modem installations are still projecting out several years before they even reach a 51% majority of the Internet market. However, the 5 million or so people with broadband access today are driving the need for better online content, which will continue to drive more people to request easy-to-use technology.

Molinari: At Media 100, we're trying to make our software and systems no more onerous technically to use than Dreamweaver, GoLive, or Photoshop, or any other publishing software. We're trying to make it all very plug-and-play. A core strategy of ours is to simplify user access to each of the steps in the workflow. That begins with capturing video from a camera and ultimately ends with hosting streaming files on a server. We want, from camera to Web, to

make the streaming production and delivery process an easy one, and one which delivers a quality viewing experience.

Has the NLE marketplace bottomed out as far as demand goes, and if so, what will turn it around?

Savello: You have to understand that there's been a tremendous change in the technology of video production. The advent of DV cameras, IEEE 1394-equipped computers and digital [online] delivery have made high-quality video production available at a much more affordable level. This was the reason for our merger with Digital Origin, a leader in the DV editing space. This affordability, coupled with a new broadcasting medium, the Internet, capable of millions of channels, is going to create a huge market for editing and streaming technology. Of course, there will always be customers who require high-performance, real-time systems with the ultimate in video quality. We're in the early stages of Digital TV and broadband deployment. As these ramp up, you'll start to see an incredible demand for new post-production and streaming technology.

What should the users of older Media 100 NLE systems know about continued development of standard NLE features for professionals who aren't interested in interactive streaming?

Savello: One way or another, broadband is going to be a delivery mechanism, either over the Internet or over the set-top box. Even the traditional broadcast market is going to need to be sensitive to interactivity and simultaneous Internet access with traditional broadcast viewing. Media 100 is going to continue to develop professional systems for professional editors but also add hooks into these systems to enable them to create content for these new media.

Is wireless technology a part of future products from Media 100, and if so, how?

Savello: We're watching closely the development of technologies to support streaming to wireless devices such as

PDAs and handheld computers. In fact, we have established relationships with some of these companies and now offer streaming media encoding as one of our Streamriver services. As some of these technologies become more standard, we'll look to integrate them into our standard products.

What do you think about a future where online editing is the norm, and the user basically performs post-production projects online?

Savello: This depends on what you mean by *online*. In the traditional video world, all digital video production today is online, meaning that you can produce broadcast-quality video right in the PC. If you're talking about actually creating your videos on the Internet, I think this will be an option for some folks, but performance and bandwidth will make this challenging for years. With that said, the Internet will begin to play an important role in the post-production process. Editors will preview content with producers and be able to make changes in real time. In the post process, you'll be able to search for, select, and license stock footage of video, audio, and still images to enhance your production – this is available today but will continue to grow. These are just some of the examples of how post production will relate to the online world.

I know that iFinish started shipping in January of 2000, and then Media 100 i for the Mac shipped late last year?

Molinari: iFinish shipped at the start of 2000 and really marked the first step we took towards permitting our systems to fully support Web developers. The strategy there from a product point of view has been to provide easy interoperability among all the systems and our products. We're really focused on quality content creation and supporting our users as they provide high-quality online experiences. That's what we're all about. ☐

Tom Patrick McAuliffe, *netmedia's* Editor@Large, is a columnist with *Video Systems* and a former U.S. Navy journalist and videographer.

The Men From Marlboro

THIS JUNE AT STREAMING MEDIA

West, dozens of companies in this industry will again show their wares. One of companies that has generated a good deal of buzz is long-time NLE manufacturer Media 100 of Marlboro, MA (www.media100.com). Over the past few months, I have spoken with John Molinari, president and CEO, and Mike Savello, vice president and general manager of the new Streamriver Services division. Both are leaders not only within the company, but also within the digital video

others, Molinari and rest of the team from Marlboro, including Savello, began to pioneer hardware and software for streaming video and audio over the Internet.

Under Molinari's leadership, Media 100 has recently completed a number of strategic initiatives to take advantage of the burgeoning Internet streaming media marketplace. The company has successfully repositioned itself as an Internet innovator and streaming media leader. At Streamriver, Savello is responsible for increasing Media 100's revenue in the streaming services sector, a market that is anticipated to be \$2.5 billion by 2003, according to several studies.

A few years ago, Media 100 was really one of the first companies in the video products industry to become super focused on the Internet. What is the result?

Savello: Since our acquisition of Terran Interactive and its Media Cleaner Pro software approximately 18 months ago, we've made further strides to establish it as the *de facto* standard in streaming media publishing. With the recent introduction of Cleaner 5 and its success in the market, it's clearly the market leader. The incorporation of Cleaner features like EventStream technology into our Media 100 i and iFinish products have led to a resurgence in our systems business as well.

What does interactivity bring to Web streaming via products like your new Media 100 i and iFinish NLE systems?

Molinari: Well, we think that interactivity makes streaming an expansion of Web publishing. The Web, by definition, is an interactive medium. Television is not. We do not believe that streaming is simply about transposing television onto the Internet.

We think that streaming is actually more about enhancing websites. Interactivity allows us to create streams that are more valuable to Web publishers because the video content can be linked to other Web assets, such as the text and graphics that comprise websites today. We want to empower Web professionals to create video content which, as it plays, can intelligently invoke other Web activities. We also want Web publishers to be able to create content that is intelligent in that it can be directed to specific audiences, narrowcasted, if you like, based on information about those audiences.

Why is that important?

Molinari: The end user inputs information simply by existing on the Internet. The ability to understand end-user behavior when they click on sites allows us to understand from a commerce point of view what their preferences are. It allows us to tailor video content to serve more specific audiences, and this tailoring, this specificity, along with the integration of streams with other Web content, makes the stream far more valuable. Of course, you have to have tools to do this, and tools haven't existed, which is what holds back streaming. The introduction of Cleaner 5, the introduction of Media 100 i, and the introduction of a number of other new products coming from Media 100 herald the arrival of tools that support streaming as an Internet-specific category, not as a transcoding, to use an engineering term, of traditional television applications to the Web.

That's a powerful statement, that Internet streaming is not just about, or doesn't need to necessarily be just about, the regurgitation of television on the Web.

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John Molinari, president and CEO of Media 100, at corporate headquarters in Marlboro, MA.

industry, becoming known for knowledgeable no-nonsense discussions of issues facing today's digital media creators. Established in 1973 originally as Data Translation, the company's multimedia group became a separate, public company called Media 100 in 1996. In the late '90s when the computer and NLE market began to sag, and the World Wide Web was all the rage, Media 100 saw the writing on the wall. The company refocused, and in a move that was subsequently followed by many

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